Vol. 942 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

January 13, 1976

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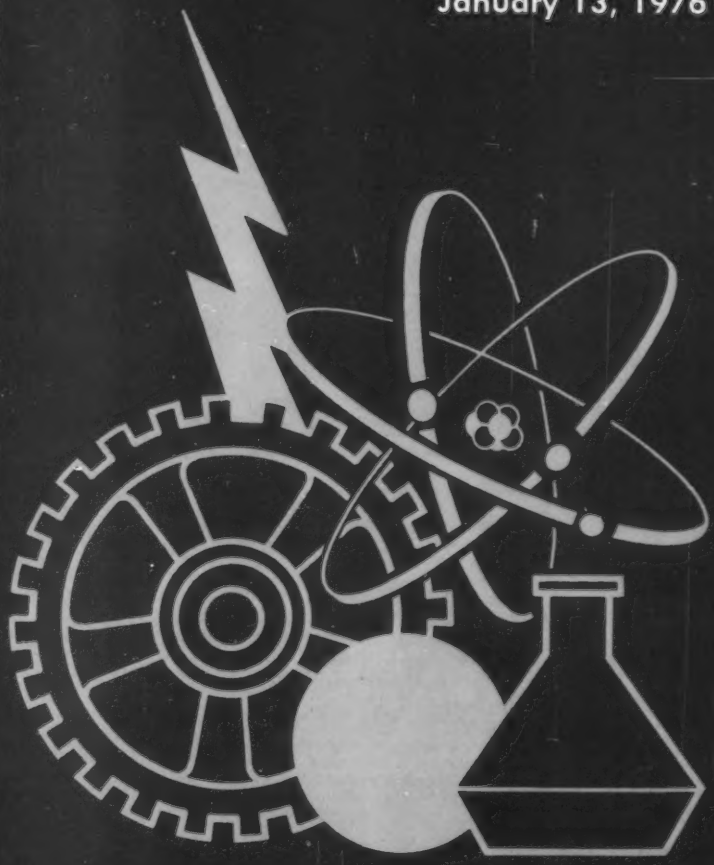

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

January 13, 1976 Volume 942 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Second Trial Voluntary Protest Program

A Second Trial Voluntary Protest Program will be conducted during the coming months. It will be increased in scale and somewhat modified in procedure from the first such program. Announcement of and description of the rules for the first program appeared in 923 O.G. 2 on June 4, 1974.

As before, the objective is to gain experience in carrying out such a program and to determine the extent of interest by the public in participating and in supplying pertinent references. To the extent there is participation, the program should be beneficial by bringing new art to the attention of the Office, preventing inadvertent issuance of invalid patents, and increasing confidence in the strength of those patents which survive the protest proceedings.

The first Trial Voluntary Protest Program showed a considerable interest by applicants and the public in taking part in protest proceedings. A summary of the results will be published soon in this Gazette. The second Trial Voluntary Protest Program is designed to gain additional information as to public participation and also to follow more closely the procedures which would be required in a continuing, permanent protest program.

Applications Involved

In the second Trial Voluntary Protest Program, a Request to Participate and Waiver of Confidentiality form (PTOL–224 Temp.) will be sent to each applicant to whom a Notice of Allowance is mailed during a selected three week period, probably in October, 1975. The total number of requests mailed will be about 4,500. Applications for plant patents will be excluded from the program. The reason for this exclusion is the high cost of printing colored drawings and the relatively limited prior art available. No other applications will be excluded from the trial program, regardless of subject matter, type of application or earlier proceedings.

Waiver of Confidentiality

Two copies of the form letter requesting voluntary waiver of confidentiality (form PTOL–224 Temp.) will be mailed in the same envelope along with the Notice of Allowance. An additional copy of the form letter will be made of record in each application at the time of mailing. The applicant will have three months from the notice of allowance date in which to either (1) elect to participate in the Trial Voluntary Protest Program by filing a signed waiver of confidentiality, or (2) elect not to participate in the program by paying the issue fee. If he does neither, the application will become abandoned, as provided in 37 C.F.R. 1.316. The waiver of confidentiality is a part of form PTOL–224 Temp. This procedure will avoid any increase in pendency time for those applications in which an election is made not to participate in the program. An early filing of a waiver of confidentiality by the applicant will result in early publication of the application.

Publication

If the applicant decides not to participate in the protest program and payment of the issue fee is timely made, the patent will issue routinely without delay.

If the applicant elects to participate in the protest program and a signed waiver of confidentiality is filed in the Office within 3 months of the notice of allowance date, the Notice of Allowance will be vacated. In such a case the issue fee should not be filed, as it will not be accepted and applied if filed with a signed waiver of confidentiality. An additional Notice of Allowance will be issued after the protest proceedings have been completed if only allowable claims remain in the application.

After a signed waiver has been filed, the application will be printed in the form of a patent and be available for sale as in the first Trial Voluntary Protest Program. At least one claim and a drawing figure, if any, will be printed in the OFFICIAL GAZETTE. These published applications will appear in about 6 to 9 issues of the OFFICIAL GAZETTE early in 1976. Advance notice will be given in the OFFICIAL GAZETTE of the dates on which applications will be published under this program.

Inspection of Files

The Patent and Trademark Office files of the published applications will be available for inspection by the public for a period of three months after publication. The application files will be retained in a single location in the Patent Issue Division during the protest period. This single location will be staffed with personnel to process papers directed to these files, supervise inspection of the files by the public, provide copies of file contents when ordered, and perform other related duties. A coin operated copying machine will also be available at this location.

Filing of Protests

Protests relating to the patentability of any published application must be filed in writing in the Patent and Trademark Office no later than three months after publication of the application. No extension of the three month protest period will be granted. Each protest must be filed in duplicate (one copy will be forwarded to the applicant and the other copy will be placed in the application file) and must indicate the grounds for protesting the allowance of any claim contained in the published application. If the protest involves prior art not of record in the application, two copies of the alleged prior art, together with an explanation of the relevance of such prior art to the allowed claims, should be included. The protester may also comment on the prior art record in the application and the manner in which it was applied.

In those applications where prima facie evidence of prior public use or sale the claimed invention is presented in accordance with 37 C.F.R. 1.292, public use proceedings will give the protester an opportunity to present evidence.

Should claims be copied from a published application for interference purposes, the applicant copying claims must also file a notice of such copying in the file of the published application to avoid the possibility of inadvertent issuance of the published application as a patent before conclusion of any interference proceedings.

For easy identification, all protests should be headed, "Protest Under Trial Voluntary Protest Program" and be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

The protester should fully identify himself and include his mailing address so that communications may be addressed to him. In view of administrative problems encountered in the first Trial Voluntary Protest Program in protecting the confidentiality of the identity of protesters, no attempt will be made by the Office to maintain the confidentiality of any protester under the new program.

If no protests are received during the protest period, the application file will be rerouted for the mailing of a new Notice of Allowance. The file will not be returned to the examining group except for consideration of matters which normally require return of an allowed file.

If one or more protests are filed in an application, the application file and the protest(s) will be returned to the examing group for consideration.

Consideration of Protest

The examining group will acknowledge receipt of all protests. The authority for deciding whether or not the evidence submitted constitutes a prima facie showing of unpatentability of any allowed claim will reside with the Group Director. If the Group Director decides that no such showing has been made, the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. Protesters will be notified in such cases that prosecution has not been reopened, and the applicant will be sent a duplicate copy of all protests. The decision of the Group Director will be final and will not be subject to petition by a protester.

If the Group Director decides that the submitted evidence constitutes a prima facie showing of unpatentability of any allowed claim, prosecution of the application will be reopened. The decision to reopen prosecution will be communicated to the applicant by means of an Office action, signed by a primary examiner, rejecting any claim considered unpatentable. The duplicate copy of each protest will be mailed to the applicant with the Office action. Protesters who submitted evidence on which the rejection is based will be identified in the Office action and will also receive copies of this and subsequent Office actions. Other protesters will be notified that prosecution has been reopened, but based on evidence and for reasons other than those submitted by them and that, consequently, no further correspondence will be directed to them. The applicant will normally be given a three month shortened statutory period to respond to the Office action.

Response by the Applicant to Subsequent Office Actions

During this period, the applicant may present amended or new claims which will be subject to further consideration by the primary examiner. In order to allow protesters who submitted evidence on which a rejection in the Office action is based to participate in later prosecution and to comment upon further proceedings, applicant will be required to serve by mail upon each protester identified in the Office action, a copy of any response filed, including any appeal brief. Indication of such service will be a required component of a complete response. Applicant need only reply to the rejections and objections made in the Office action. There need be no specific response to any other points raised by the protesters.

Comment on Applicant's Response by the Protester

Each protester served will be allowed one month, running from the date applicant's response or brief is received in the Patent and Trademark Office, to file comments relating thereto. All communications from protesters must be in writing. Examiner interviews with the protesters will not be permitted. No extensions of the one month period will be granted.

Any appeal by the applicant to the Board of Appeals in a protested application will be made special and will be taken up out of order.

Conclusion of Prosecution

If, after further prosecution, the application is found to be allowable, all protesters still participating at that time will be notified and the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. A decision of the primary examiner to allow an application will not be subject to petition or appeal by any protester.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Sept. 16, 1975.

[938 O.G. 945]

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,802,760, Derick and Frosch, OXIDATION OF SEMICONDUCTIVE SURFACES FOR CONTROLLED DIFFUSION, filed Sept. 19, 1975, D.C.,N.D. Calif. (San Francisco), Doc. C–75–1966–RFP, *Western Electric Company, Incorporated* v. *Intel Corp.;* filed Sept. 19, 1975, D.C. Del. (Wilmington), Doc. 75–307, *Western Electric Company* v. *Teledyne, Inc.;* filed Sept. 19, 1975, D.C. Del. (Wilmington), Doc. 75–308, *Western Electric Company* v. *Intersil, Inc.;* filed Sept. 19, 1975, D.C. Del. (Wilmington), Doc. 75–309, *Western Electric Company, Inc.* v. *Solid State Scientific, Inc.*

3,056,224, Almy and Zentmyer, TESSELLATED SURFACE COVERING; **3,170,808,** same, A METHOD OF FABRICATING A TESSELLATED SURFACE COVERING, filed June 4, 1968, D.C.N.J. (Newark), Doc. 564–68 *Armstrong Cork Co.* v. *Congoleum-Nairn, Inc.* Order of dismissal of action, Sept. 23, 1975.

3,170,808. (See 3,056,224.)

3,175,256, R. C. Horton, WEATHER STRIP; **3,745,053,** Johnson and Newton, WEATHERSTRIP, filed Sept. 25, 1975, United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati), Doc. 74–2256, *The Schlegel Manufacturing Company* v. *USM Corporation.* The judgment of the District Court is affirmed and the cause is remanded for an accounting and other relief to which the plaintiff may be entitled, Sept. 25, 1975.

3,317,642, R. L. Bailey, VOLUME STABILIZATION OF MOLDED PLASTIC CONTAINERS BY HEATING AFTER MOLDING, filed Oct. 6, 1975, D.C., N.D. Ohio (Cleveland), Doc. C75–876, *Graham Engineering Corporation* v. *Kemp Products, Ltd., Kemp Products, Inc.* and *Carlisle Corporation.*

3,458,414, Crane and Stevens, SWIMMING POOL WATER CONDITIONER, filed Feb. 11, 1975, D.C., N.D. Calif. (San Francisco), Doc. C–75–0304, *Geni-Chlor International, Inc.* v. *Multisonics Development Corp.*

3,478,341, A. J. DePietro, HINGE JOINT FOR DENTAL ARTICULATOR, filed Aug. 16, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–1918–LTL, *Anthony J. DePietro* v. *Denar Corporation, August Belmont, Miles Guichet* and *Emily Guichet.* Filed consent judgment and order thereon dismissing complaint and counterclaim without prejudice as to defendants August Belmont, Dr. Niles Guichet and Emily Guichet, that defendant Denar Corp. has infringed on plaintiff's patent, said defendant are enjoined from further use of plaintiff's patent, entered July 8, 1975.

3,585,454, R. L. Stevenson, SKATEBOARD WITH INCLINED FOOT-DEPRESSIBLE LEVER, filed Sept. 24, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–3233–ALS. *Richard Lawrence Stevenson* v. *Grentec, Inc.*

3,585,352, A. J. Zvanut, ARC WELDING PROCESS AND ELECTRODE FOR STAINLESS STEEL; **3,848,100,** same, **Re. 28,326,** same, ARC WELDING ELECTRODE AND PROCESS FOR STAINLESS STEEL, filed June 26, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–2218–R, *Stoody Co.* v. *Teledyne, Inc., doing business as Teledyne McKay;* filed Sept. 30, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75–3303–WMB, *Teledyne Mid-America, Inc.* v. *Stoody Company.*

3,645,026, L. G. Lorch, ARTICULATED FLAG CONSTRUCTION, filed Oct. 2, 1975, D.C., N.D. Calif. (San Francisco), Doc. C–75–2082–SW, *Leonard G. Lorch* v. *Michael G. Oldham.*

3,659,284, W. T. Rusch, TELEVISION GAMING APPARATUS; **3,659,285,** Baer, Rusch and Harrison, TELEVISION GAMING APPARATUS AND METHOD, filed Sept. 22, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3153, *The Magnavox Co., et al.* v. *Sears, Roebuck & Co.*

3,659,285. (See 3,659,284.)

3,678,542, E. Prete, Jr., CAM BUCKLE, filed June 25, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–2202–AAH, *Ancra Corporation* v. *Circle Industries, Inc.* Filed stipulation and order dismissing action without prejudice, entered Sept. 23, 1975.

3,711,806, R. W. Flentge, POWER PACK; **Re. 28,490,** same, filed Oct. 3, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3312, *A. F. Dormeyer Manufacturing Co., Inc.* v. *Coils, Inc.*

3,736,930, H. W. Georgi, PARENTERAL ADMINISTRATION FLUID FLOW CONTROL SYSTEM, filed Dec. 10, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–3609–R, *Ivac Corp.* v. *LaBarge Incorp., Tekmar S.A.* and *Tekmar Medical Ltd.* Filed final consent judgment and order thereon enjoining defendants from further use, etc. of plaintiff's patent, entered Sept. 3, 1975.

3,745,053. (See 3,175,256.)

3,838,568, Zurcher and Merles, ELECTRONIC WATCH MOVEMENT MOUNTING AND CONNECTION, filed Nov. 27, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74–3478–LTL, *Hughes Aircraft Company* v. *Frontier, Inc.* Filed consent judgment and order thereon that patent is valid, that defendants be permanently enjoined from making or selling said patent, entered Sept. 16, 1975.

3,848,100. (See 3,585,352.)

Re. 28,326, (See 3,585,352.)

Re. 28,490. (See 3,711,806.)

D–221,833, R. S. Haydock, CASTER WHEEL, filed Oct. 1, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3270, *Mildred Rose Haydock* v. *Radio Steel & Mfg. Co.*

D–228,930, R. Bannwart, Sr., WRISTWATCH, filed Sept. 29, 1975, D.C., S.D.N.Y. (New York), Doc. 75–C–4767 LWP, *Corum Watch Corporation* v. *Sutton Time Ltd.*

PATENT NOTICES

Certificates of Correction for the Week of Jan. 13, 1976

D. 232,762	3,779,144	3,887,244	3,905,484
D. 234,217	3,788,213	3,889,227	3,905,543
3,449,310	3,789,101	3,889,974	3,905,797
3,575,734	3,802,828	3,891,779	3,908,614
3,676,389	3,806,027	3,892,850	3,908,850
3,682,388	3,834,808	3,893,843	3,908,893
3,688,711	3,836,329	3,894,625	3,909,487
3,690,737	3,846,462	3,894,939	3,909,775
3,691,192	3,855,684	3,895,216	3,910,096
3,691,476	3,860,086	3,895,553	3,910,108
3,696,118	3,861,369	3,897,723	3,910,232
3,714,191	3,862,253	3,899,453	3,910,799
3,715,683	3,864,035	3,901,590	3,911,597
3,718,796	3,865,550	3,902,026	3,912,060
3,721,043	3,866,201	3,902,993	3,912,254
3,725,781	3,869,936	3,904,566	3,912,483
3,739,720	3,872,057	3,904,634	3,912,869
3,763,692	3,879,375	3,905,028	3,913,031
3,769,302	3,883,478	3,905,254	

Dedication

3,866,283.—David E. Gould, Oxford, Mass. MULTI-GROOVE ROLL MOUNTING. Patent dated Feb. 18, 1975. Dedication filed Nov. 20, 1975, by the assignee, Morgan Construction Company.

Hereby dedicates the remaining term of said patent to the Public.

Adverse Decisions in Interferences

In the designated interference involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,342,250, H. Treppschuh and R. L. Hentrich, METHOD OF AND APPARATUS FOR VACUUM MELTING AND TEEMING STEEL AND STEEL-LIKE ALLOYS, Interference No. 96,657, decided October 16, 1975, claims 8, 10, 11, 12, 17, 18, 20, 22, and 23.

Patent No. 3,524,876, J. E. Gregson, Jr., N,N-DIMETHYLOLCARBAMATES OF ETHER ALCOHOLS, Interference No. 98,037, decided June 23, 1975, claim 3.

Patent No. 3,590,472, J. R. Nix, M. R. Sargent and W. T. Kaariela, COMPOSITE MATERIAL FOR MAKING CUTTING AND ABRADING TOOLS, Interference No. 98,064, decided December 9, 1974, claim 1.

Patent No .3,635,957, G. R. Genta, STYRYL DYES, Interference No. 98,174, decided August 13, 1975, claim 2.

Patent No. 3,658,846. E. M. Chamberlin, E. E. Harris and J. L. Zabriskie, Jr. INTERMEDIATES FOR SYNTHESIS OF VITAMIN B_6 AND RELATED COMPOUNDS, Interference No. 98,640, decided August 25, 1975, claims 1 and 2.

Patent No. 3,665,032, H. A. Burch and T. J. Schwan, RESOLUTION OF L-DOPA INTERMEDIATE, Interference No. 98,244, decided August 7, 1975. Claim 1.

Patent No. 3,816,536. U. Eder and G. Sauer, 2,2-DISUBSTITUTED CYCLOALKANE-1,3-DIONES, Interference No. 98,992, decided August 12, 1975, claims 1, 2 and 8.

Patent No. 3,822, 496. D. V. Minder, DISPLAY PLATE FOR OPENERS OF PRE-SCORED CANS, Interference No. 98,940, decided September 19, 1975, claims 1, 2, 3, 8, 9, and 10.

Disclaimers

3,549,070.—John W. Frost, Appleton, Roy E. Downham and Jack F. Eckelaert, Neenah, Wis. FLOTATION OF SHEET MATERIALS. Patent dated Dec. 22, 1970. Disclaimer filed Nov. 12, 1975, by the assignee TEC Systems, Inc.

Hereby enters this disclaimer to claims 1, 2, 7, 8, 9, 10, 13, 14 and 15 of said patent.

3,712,764.—Raymond S. Shearwood, Norwalk, Conn. ADJUSTABLE CONSTRUCTION FOR MATING SURFACES OF THE ROTOR AND PORT MEMBER OF A LIQUID RING PUMP. Patent dated Jan. 23, 1973. Disclaimer filed Nov. 18, 1975, by the assignee, Nash Engineering Company.

Hereby enters this disclaimer to all claims of said patent.

3,796,365.—Hugh N. Downing, Marysville, Wash. NAILING GUN CARRIAGE. Patent dated March 12, 1974. Disclaimer filed Nov. 7, 1975, by the assignee, Glen D. Johnson.

Hereby enters this disclaimer to claims 16 and 26 of said patent.

3,841,846.—Earl I. Larsen, Indianapolis, Ind. and Richard H. Krock, Weston, Mass. LIQUID PHASE SINTERED MOLYBDENUM BASE ALLOYS HAVING ADDITIVES AND SHAPING MEMBERS MADE THEREFROM. Patent dated Oct. 15, 1974. Disclaimer filed Nov. 5, 1975, by the assignee, P. R. Mallory & Co. Inc.

The term of this patent subsequent to March 19, 1990, has been disclaimed.

3,848,109.—Albert J. Zvanut, Whittier, Calif. ARC WELDING PROCESS AND ELECTRODE FOR STAINLESS STEEL. Patent dated Nov. 12, 1974. Disclaimer filed Oct. 31, 1975, by the assignee, Stoody Company.

The term of this patent subsequent to June 15, 1988, has been disclaimed.

3,904,303.—H. Allen Becht, Williamsville, James Campbell, Kenmore, James J. Kerschner, Boston, N.Y., and Edward J. Krollman, Hamilton, Ontario, Canada. COMPOSITE EXPANSION JOINT ASSEMBLY. Patent dated Sept. 9, 1975. Disclaimer filed Nov. 7, 1975, by assignee, Acme Highway Products Corporation.

The term of this patent subsequent to Aug. 20, 1991, has been disclaimed.

3,912,642.—Robert J. Stirwold and Fred O. Barrett, Cincinnati, Ohio. ESTER LUBRICANTS SUITABLE FOR USE IN AQUEOUS SYSTEMS. Patent dated Oct. 14, 1975. Disclaimer filed Nov. 3, 1975, by the assignee, Emery Industries, Inc.

Hereby enters this disclaimer to claims 1, 2, 3 and 4 of said patent.

3,914,376.—George E. Barker, St. Louis, Mo. LAYERED RHODIUM AND NICKEL CATALYST FOR NO_x REDUCTION. Patent dated Oct. 21, 1975. Disclaimer filed Aug. 6, 1975, by the assignee, Monsanto Company.

The term of this patent subsequent to Aug. 5, 1992, has been disclaimed.

Patents Available for Licensing or Sale

3,807,095. ROCK SAW. A. C. Harding, (deceased) Ella M. Fry, Administratrix, 3601 E. Funston, Wichita, Kans., 67218.

3,826,391. BOAT TRAILER. Amos C. Prince, P.O. Box 894, Goldsboro, N.C., 27530.

3,916,357. DEVICE FOR REDUCING TARNISH AND CORROSION BUILD-UP IN TELEVISION TUNERS. Harold W. Jones, 829 Ridgecrest Drive, Bowling Green, Ky., 42101.

3,840,968. HYDRAULIC SLIP JOINT PIPE PULLER. Pauline E. Mason, 833 E. Fountain Blvd., Colorado Springs, Colo., 80903.

3,921,649. DENTAL CARE KIT. Mrs. Mary G. Milbrath, 2310 Edna Ave., Park Ridge, Ill., 60068.

3,882,824. GROOMING AID FOR HAIRY ANIMALS. Gwendolyn Kay Acquaviva, 936 Ledge Road, Medina, Ohio, 44256.

3,907,243. ARTICLE HOLDER. John P. Gidos, P.O. Box 205, Ludlow, Pa., 16333.

3,764,930. HIGH FIDELITY AUDIO AMPLIFIER. Ronald J. Bakken, 3918 31st Ave. S., Minneapolis, Minn., 55406.

3,832,498. ADAPTER ENABLING TELEPHONE SWITCHING EQUIPMENT TERMINALS TO BE WIRE WRAPPED. Edward L. Lawson, 538 N. Fifth St., Bayport, Minn., 55003.

3,875,557. HEADLIGHT WARNING SYSTEM FOR VEHICLES. Stuart R. Peterson, 790 Southgate Office Plaza, Minneapolis, Minn., 55437.

3,826,717. QUANTITATIVE ANTIBIOTIC TEST CONTAINER. Dr. Verne E. Gilbert, 301 Blount Professional Building, Knoxville, Tenn., 37920.

3,908,924. WINDING MACHINES. Wilhelm Schulze, Germany, Assignor to Maschinenbau Greene GmbH & Company, Ky. Kreiensen, Germany. Correspondence to: Fidler, Patnaude & Batz 1211 W. 22nd St., Oak Brook, Ill., 60521.

3,916,924. APPARATUS FOR EMPTYING AND RINSING CONTAINERS. Francis E. McGowan, 2773 Curtis Way, Sacramento, Calif., 95818.

3,900,646. METHOD OF PLATING METAL UNIFORMLY ON AND THROUGHOUT POROUS STRUCTURES. Robert A. Clyde, P.O. Box 430820, South Miami, Fla., 33142.

3,895,646. SELF-REGULATING VANE TYPE VALVE FOR CONTROLLING FLUID FLOW. Manuel G. Howat, 24 Douglas St., Victoria, Columbia, Canada.

3,180,128. CRIMPING TOOL. Ottis V. Faulkner, Houston, Tex. Correspondence to: Lester L. Hewitt, 600 Jefferson, Suite 2010, Houston, Tex., 77002.

3,914,894. AUTOMATIC FISH HOOK SETTER. Julius J. Kobza, P.O. Box 584, Sonoma, Calif., 95476.

3,910,146. GUIDE FOR SABER SAW. William L. Earl, 439 Church Road E., King of Prussia, Pa., 19406.

3,295,562. METHOD AND APPARATUS FOR ROUTING AND LAYING WIRES. William Concannon, 30 Dewey Road, Cheltenham, Pa., 19012.

3,803,701. METHOD OF EXTRUDING LIFE OF COPPER ANODE MOULDS. Robert H. Peterson, 54 Abbot Road, Wellesley Hills, Mass., 02181.

3,847,766. PROCESSES FOR TREATMENT OF CRUDE CALCIUM SULFATE TO RENDER IT SUITABLE FOR CONVERSION TO PLASTER OF PARIS. Fels-Werke Peine-Salzgitter, GmbH, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,912,360. MICROSCOPIC FIELD MARKER. Frank L. Becke, Box 836, Eastville, Va., 23347.

3,834,003. FRAMING TEMPLATE. Richard L. Pinkard, 316 Ferndale Drive, Collinsville, Va.

General Electric Company is prepared to grant non-exclusive licenses under the following patents on reasonable terms to domestic manufacturers.

Applications for licenses under the following patents may be addressed to: Division Patent Counsel, Switchgear Equipment Bus. Div., General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,913,459. RING LATCH FOR RELEASABLY RESTRAINING A PISTON WITHIN A CYLINDER.

Application for license under the following 1 patent may be addressed to: Division Patent Counsel, Space Division, General Electric Company, P.O. Box 8555, Philadelphia, Pa., 19101.

3,906,120. METHOD FOR PREPARING SLIDES FOR BLOOD EVAULATION.

Application for license under the following 1 patent may be addressed to: General Electric Company, Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn., 06602.

3,890,985. APPLIANCE ACCESSORY ATTACHMENT MEANS.

Application for license under the following 2 patents may be addressed to: Patent Counsel, Speed Variator Products Section, General Electric Company, 1501 Roanoke Blvd., Salem, Virginia, 24153.

3,453,524. INVERTER COMMUNICATION CIRCUIT.

3,471,716. POWER SEMICONDUCTOR GATING CIRCUIT.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 80 patents.

Inquires respecting licenses under these patents should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y., 10036.

3,911,176. METHOD FOR VAPOR-PHASE GROWTH OF THIN FILMS OF LITHIUM NIOBATE.

3,911,295. WAVEFORM GENERATING CIRCUIT.

3,911,377. RELAXATION OSCILLATOR HAVING STABLE PULSE WIDTH.

3,911,453. TWO COLOR INFORMATION RECORD.

3,911,467. INTERLACED READOUT OF CHARGE STORED IN CHARGE-COUPLED IMAGE SENSING ARRAY.

3,911,476. COLOR PICTURE/SOUND RECORD.

3,912,283. TURNTABLE SPEED LOCK SYSTEM.

3,912,363. OPTICAL FIBER TO PLANAR WAVEGUIDE COUPLER.

3,912,370. AC DEFORMABLE MIRROR LIGHT VALVE.

3,912,386. COLOR IMAGE INTENSIFICATION AND PROJECTION USING DEFORMABLE MIRROR LIGHT VALVE.

3,912,849. COMPOSITE PRINTED CIRCUIT BOARD.

3,912,857. STYLUS ARM PIVOT.

3,912,867. FOUR-WIRE CONFERENCE CIRCUIT.

3,912,942. SIGNAL COMPARISON CIRCUIT.

3,912,977. DIRECT CURRENT PROTECTION CIRCUIT.

3,913,006. VOLTAGE REGULATOR CIRCUIT WITH RELATIVELY LOW POWER CONSUMPTION.

3,913,028. PHASE LOCKED LOOP INCLUDING AN ARITHMETIC UNIT.

3,913,038. ELECTROSTATIC RADIATION FILTER FOR COAXIALLY FED HOT CHASSIS TELEVISION RECEIVER.

3,913,040. MICROSTRIP CARRIER FOR HIGH SPEED SEMICONDUCTOR DEVICES.

3,913,359. DYEING STATION IN AN APPARATUS FOR CONTINUOUSLY DYEING FIBROUS MATERIAL.

3,914,136. METHOD OF MAKING A TRANSMISSION PHOTOCATHODE DEVICE.

3,914,515. PROCESS FOR FORMING TRANSITION METAL OXIDE FILMS ON A SUBSTRATE AND PHOTOMASKS THEREFROM.

3,914,542. TIMING SIGNALS FOR VELOCITY ERROR CORRECTION.

3,914,653. VOLTAGE REGULATOR FOR DEFLECTION CIRCUIT.

3,914,684. CURRENT PROPORTIONING CIRCUIT.

3,914,696. CONTROLLABLE REFERENCE SUPPLY FOR TELEVISION TUNERS.

3,914,702. COMPLEMENTARY FIELD-EFFECT TRANSISTOR AMPLIFIER.

3,914,704. FEEDBACK AMPLIFIER.

3,914,711. GATED OSCILLATOR HAVING CONSTANT AVERAGE DC OUTPUT VOLTAGE DURING ON AND OFF TIMES.

3,914,762. ELECTRONIC IDENTIFICATION SYSTEM.

3,915,533. DEVICE AND METHOD FOR RESTORING CATHODE EMISSION IN A THERMIONIC ELECTRON TUBE.

3,915,549. CRYSTALS FOR RECORDING PHASE HOLOGRAMS.

3,915,565. SIGNAL SENSING FOR FILM PROJECTORS.

3,915,566. AUTOMATIC SIGNAL PLAYBACK FOR FILM PROJECTORS.

3,915,574. METHOD FOR DETERMINING AN ACCURATE ALIGNMENT OF A LASER BEAM.

3,915,717. STABILIZED AUTOCATALYTIC METAL DEPOSITION BATHS.

3,916,056. PHOTOMASK BEARING A PATTERN OF METAL PLATED AREAS.

3,916,244. PLURAL-BEAM COLOR PICTURE TUBE WITH IMPROVED MAGNETIC CONVERGENCE.

3,916,333. DIFFERENTIAL AMPLIFIER.

3,916,336. RADIANT ENERGY DEVICE MOUNT.

3,916,339. ASYMMETRICALLY EXCITED SEMICONDUCTOR INJECTION LASER.

3,916,346. MODULATOR.

3,916,348. TEMPERATURE-COMPENSATED SURFACE-PROPAGATED WAVE ENERGY DEVICE.

3,916,415. ANTENNA SCANNING.

3,916,430. SYSTEM FOR ELIMINATING SUBSTRATE BIAS EFFECT IN FIELD EFFECT TRANSISTOR CIRCUITS.

3,916,431. BIPOLAR INTEGRATED CIRCUIT TRANSISTOR WITH LIGHTLY DOPED SUBCOLLECTOR CORE.

3,916,437. PURITY ADJUSTMENT FOR COLOR DISPLAY SYSTEM.

Patents Withdrawn From Register

General Electric Company hereby withdraws the following patent from the Register Patents Available for licensing or Sale. The patent was listed as being available in the "OFFICIAL GAZETTE" as indicated below.

3,136,001. MOLD FOR MOLDING DYNAMICALLY BALANCED FANS, February 1, 1966.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 20, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	3-19-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-2-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-13-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-3-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-21-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-23-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-13-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-1-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-20-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-17-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	7-18-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-3-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	4-1-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-2-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	2-19-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	5-27-75

Expiration of patents: The patents within the range of numbers indicated below expire during January 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,866,973 to 2,871,478 inclusive
Plant Patents..... Numbers 1,792 to 1,804 inclusive

PATENT APPLICATIONS

PUBLISHED JANUARY 13, 1976
UNDER THE SECOND TRIAL VOLUNTARY PROTEST PROGRAM

NOTE- A copy of the notice setting forth the details of the Second Trial Voluntary Protest Program may be found in the Patent and Trademark Notices section of this issue.

Any protests relating to the patentability of these published applications must be filed in writing before April 13, 1976. These applications are available for inspection in the Allowed Files Branch, Crystal Plaza, Room 2-10C28. All correspondence should be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

Printed copies of the published applications may be purchased from the Patent and Trademark Office at 50 cents each.

An "Index of Applicants and Assignees of Published Applications" and a concordance entitled "Classification of Published Patent Applications" are located in the back of this issue.

GENERAL AND MECHANICAL APPLICATIONS

B 405,726
SELF-LEVITATING SIGNAL CARTRIDGE

Leonard R. Ambrosini, Churchville, Md., and Raymond S. Isenson, Vandenberg AFB, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 11, 1973, Ser. No. 405,726
Int. Cl.[2] F42B *4/06, 4/26*
U.S. Cl. 102—32 **2 Claims**

References Cited
UNITED STATES PATENTS

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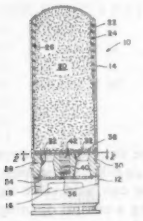
2,489,953	11/1949	Burney	102/49.7
2,644,364	7/1953	Nass	102/49.7 X
3,023,570	3/1962	Crouch	102/103 X
3,245,350	4/1966	Kelly	102/65.2 X
3,750,574	8/1973	Lohkamp	102/32



1. In a pyrotechnic signal cartridge comprising:
a. a cartridge case,
b. a projectile case detachably secured to said cartridge case,
c. a projectile initial propulsion charge in said cartridge case for launching said projectile case,
d. a rocket motor means, including a plurality of rocket nozzle ports, closure means for said ports positioned within said projectile case, a solid pyrotechnic signal composition, and a solid rocket motor propellant composition,
e. ignition means including an ignition composition and a delay column for said solid pyrotechnic signal composition and said solid rocket motor propellant composition, wherein the improvement comprises, said solid rocket motor propellant composition and said solid pyrotechnic signal composition present in admixture in said projectile case and wherein said compositions present in admixture have a conical configuration with diameter gradually decreasing with distance from said rocket nozzle parts such that burning of said compositions in admixture after launching of said projectile case balances the thrust of the rocket motor means against the mass of the cartridge providing a thrust-to-weight ratio of approximately unity which effect causes a self levitating display.

B 412,068
PYRAMID PROJECTILE PAYLOAD EJECTION DEVICE

Louis J. Adimari, Lake Hiawatha, and George D. Dusoe, Oak Ridge, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 229,847, Feb. 28, 1972, abandoned. This application Nov. 2, 1973, Ser. No. 412,068
Int. Cl.[2] F42B *13/50*
U.S. Cl. 102—69 **9 Claims**

References Cited
UNITED STATES PATENTS

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3,404,630	10/1968	Grandy	102/90
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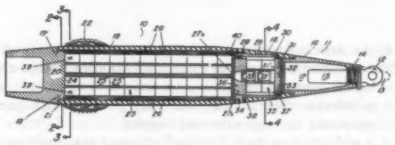
3,677,182	7/1972	Peterson	102/90

FOREIGN PATENTS OR APPLICATIONS

859,382	6/1940	France	102/35.6



1. A projectile for dispensing a payload at a selected point along its trajectory, comprising:
a housing including a forward ogive portion, a rear separatable base plug portion, and an intermediate hollow cylindrical portion filled with a first payload,
an elongated hollow cylindrical pusher assembly means adjacent to said first payload and slidingly disposed substantially entirely within said ogive portion for movement rearwardly in said housing, with at least an annular portion of its peripheral wall in bearing contact with the inner wall of said housing, said pusher assembly means being open at its rear end and closed at the other end and filled with an additional payload,
an expulsion charge means disposed within said ogive portion forward of said pusher assembly means for explosively generating an expanding gas, and
fuze means for selectively activating said charge means;

whereby, upon activation of said charge means, said gas and said pusher assembly means will eject both of said payloads rearwardly from said housing.

B 425,588
ARTICLE FOR DEFINING AN AUXILIARY COMPARTMENT FOR AN ENGINE COMBUSTION CHAMBER

Michael C. Turkish, Lyndhurst, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 17, 1973, Ser. No. 425,588
Int. Cl.² F02B *19/10*
U.S. Cl. 123—325 T **26 Claims**

References Cited
UNITED STATES PATENTS

1,662,989	3/1928	Stroud	123/32 AA
1,926,499	9/1933	Ricardo	123/75 B
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3,058,452	10/1962	Espenshied	123/325 P
3,105,470	10/1963	Hockel et al.	123/325 P
3,111,117	11/1963	Gotz	123/30 C
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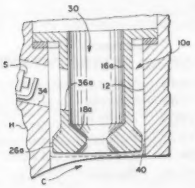

1. An article for use in defining an auxiliary compartment of the combustion chamber of an internal combustion engine, said article comprising:

a. a tubular central heat receiving portion with one end open and the opposite end cupped;

b. a mounting portion disposed adjacent said open end and extending in a direction generally outwardly from the wall of said central portion;

c. at least one aperture formed in said cupped end for communicating the interior region of said central portion with the engine combustion chamber; and

d. a heat output portion adjacent said cupped end and extending in a direction generally outwardly from the outer periphery of said central portion, said heat output portion having predetermined dimensions such that, upon attachment of said article in an engine combustion chamber by said mounting portion, said article expands during initial engine warm-up and said heat output portion contacts, initially spaced adjacent walls of the engine combustion chamber at a predetermined temperature with said central portion spaced from said adjacent chamber walls and said heat output portion remains in such contact at temperatures greater than said predetermined value for conducting heat only from the heat output portion of the cupped end of said article to the walls of the combustion chamber.

B 430,172
CLAMP-ON VALVE STRUCTURE

Leonard J. Kowal, Prospect Heights, and Robert C. Gibson, Chicago, both of Ill., assignors to Imperial-Eastman Corporation, Chicago, Ill.

Filed Jan. 2, 1974, Ser. No. 430,172
Int. Cl.² B67B *7/24*
U.S. Cl. 137—798 **21 Claims**

References Cited
UNITED STATES PATENTS

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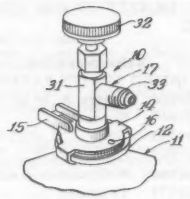

1. A clamp-on valve structure for use with a can of pressurized fluid having an annular, projecting lip encircling a connecting portion of the can, said valve structure comprising: a mounting plate having a central opening defined by an internally threaded, annular valve mounting portion, lug means defining first and second lip engagement portions equiangularly spaced from a diametric centerline bisecting said annular portion to extend rearwardly of a diameter of said annular portion perpendicular to said centerline, and means defining a stop; a lever defining a pivot portion, a manipulating portion, a third lip engagement lug means, and means defining a shoulder; means pivotally connecting said pivot portion to said mounting plate rearwardly of said perpendicular diameter; and a valve having a threaded mounting means removably mounted to said threaded annular portion of the mounting plate and including a portion extending into the path of pivotal movement of said lever, said lever being arranged to urge said pivot forwardly to force said first and second lug means clampingly against the container lip as an incident of said lever being swung to a clamping position wherein said third lug means is forced against said lip adjacent the forward end of said centerline, said lever shoulder abutting said mounting plate stop to positively prevent pivotal movement beyond said clamping position, said lever extending between said mounting plate stop and said valve portion to positively prevent pivotal movement of the lever forwardly from said clamping position when said lever is swung to said clamping position and said valve is threadedly mounted to said mounting plate.

B 452,672

VEHICLE RETARDATION

Dennis H. Ogden, Wolverhampton, England, assignor to British Industrial Plastics Limited, Manchester, England

Filed Mar. 19, 1974, Ser. No. 452,672

Claims priority, application United Kingdom, Mar. 23, 1973, 14107/73

Int. Cl.² E01C 7/00; C08J 9/00

U.S. Cl. 404—71 9 Claims

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UNITED STATES PATENTS

3,511,689	5/1970	Winkler	117/70

FOREIGN PATENTS OR APPLICATIONS

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1. A vehicle deceleration bed comprising at least two layers of a non-resilient cured foam of an aminoplast resin material laid on a vehicle trackway, the layers being coextensive and in superposed relation to one another, the density and compressive strength properties of the foam in each layer being sensibly constant throughout said layer, but different from the density and compression strength properties of any other layer.

B 461,257

PACKING CONTAINER

Goran Larsson, Dalby, and Lars Carlsson, Staffanstorp, both of Sweden, assignors to AB Ziristor, Lund, Sweden

Filed Apr. 15, 1974, Ser. No. 461,257

Claims priority, application Sweden, Apr. 24, 1973, 7305711

Int. Cl.² B65D 5/72

U.S. Cl. 229—17 R 2 Claims

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2,523,246	9/1950	Elliott et al.	229/17 R X
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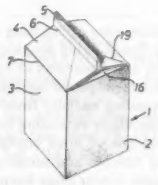

1. In a rectangular package composed of a packaging material coated on both sides with at least one layer of a thermoplastic coating material, said package being of the type having a top closure including a fin formed by a face to face seal of the outer portions of two opposed top closure flaps of opposed walls and triangular folds of the two closure flaps of the other opposed walls, said top closure being capable under a load to lie flat in a substantially plane end face, the improvement comprising crease lines between the outer portions of the two opposed top closure flaps of the opposed walls which form the fin and the inner portions of said flaps, one of said crease lines having a harder crease than the other of said crease lines so that said sealed fin will normally lean at an acute angle to the vertical in a direction toward the harder crease line so as to facilitate forming the substantially plane end face when subjected to a load.

B 463,671

TRACTOR CAB MOUNTING APPARATUS

Robert B. Kennicutt, Morton, and William T. Mounts, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 278,731, Aug. 8, 1972, Pat. No. 3,847,492.

This application Apr. 24, 1974, Ser. No. 463,671

Int. Cl.² B62D 27/04

U.S. Cl. 296—35 R 7 Claims

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2,171,947	9/1939	Parker	296/35 R
2,386,463	10/1945	Hile	248/10 X
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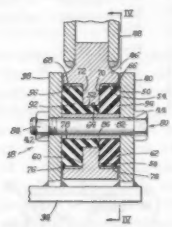

1. In combination with a tractor and a tractor cab, a plurality of mounting means for mounting said cab to said tractor at a plurality of points, each mounting means comprising:

a. a pair of spaced, generally parallel plates extending outwardly from one of the tractor or cab, the plates defining axially aligned apertures;

b. an annular lug member extending outwardly from the other of the tractor and cab and defining a lug aperture having (i) a first cylindrical portion of a first radius, (ii) a second cylindrical portion of a second radius greater than said first radius, and (iii) a radial portion interconnecting the first and second lug member aperture cylindrical portions;

c. annular resilient means having (i) a first external cylindrical portion of a certain radius sized to fit within the lug member first cylindrical portion, (ii) a second external cylindrical portion of a second radius greater than said first resilient means radius to fit within the lug member second cylindrical portion, and (iii) a radial portion interconnecting the first and second resilient means cylindrical portions, one of the lug member aperture cylindrical portions being sized to continuously contact the external resilient means cylindrical portion fitted therein, while the other lug member aperture cylindrical portion is sized to be continuously spaced from the external resilient means cylindrical portion fitted therein, to form an annular gap therebetween, and (iv) defining a bore the axis of

which is aligned with the axes of the plate apertures; and, (Claim 1 continued)

d. shaft means disposed through the plate apertures and resilient means bore and in contact with such resilient means bore, so that the lug member is movable in directions generally perpendicularly to the axis of the shaft means against the resiliency of one cylindrical portion only of the resilient means for a certain amount of travel, and against the resiliency of both cylindrical portions of the resilient means for additional travel.

B 467,412

COMBINED DIAL SCALE AND STATION INDICATOR

Paul B. Gilbert, Chicago, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed May 6, 1974, Ser. No. 467,412
Int. Cl.² G11B *31/00*; H03J *01/04*
U.S. Cl. 116—124.4 **14 Claims**

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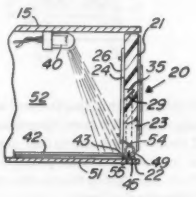
1,894,111	1/1933	Marcellus	350/113 X
2,215,310	9/1940	Zupanee	350/113
2,328,485	8/1943	Ott	116/129 L
2,402,856	6/1946	Turrettini	350/114 X
2,428,792	10/1947	Evans	116/129 P
2,520,028	8/1950	Biskind	116/129 L
2,711,711	6/1955	Harman	116/124.4
2,823,639	2/1958	Vistain, Jr. et al.	116/124.4
2,885,992	5/1959	Roberts et al.	116/124.4
2,972,283	2/1961	Karnow	350/114 X
3,344,700	10/1967	Brake	350/112 X
3,513,805	5/1970	Sizer	116/124.4
3,536,859	10/1970	Tolar	179/100.11
3,692,383	9/1972	Herod et al.	350/96 R
3,761,704	9/1973	Takeiche et al.	116/124.4 X
3,800,328	3/1974	Harlan et al.	360/137
3,821,489	6/1974	Kocubej	179/100.11



1. In a radio receiver and magnetic tape player combination having a radio tuning control mechanism for controlling the frequency to which the radio receiver is tuned, and a housing provided with an opening to receive a magnetic tape cartridge, the combination including:

a door having indicia thereon to indicate the frequency to which the radio receiver is tuned, said door being mounted in the housing and movable between a first position wherein the opening is closed and a second position clear of the opening to prevent entry of a cartridge;

a pointer movably mounted in the housing and operatively connected to the radio control mechanism, said pointer having a reflecting surface thereon;

reflection means including an angled reflecting surface provided in said door in position adjacent said indicia on said door for cooperating with the reflecting surface on said pointer; and

illumination means mounted in the housing for illuminating the reflecting surface on said pointer such that the reflection therefrom impinges upon said reflection means to illuminate said indicia on said door when said door is in the first position to indicate the frequency to which the radio receiver is tuned.

B 470,170

INDEXING MECHANISM

James H. Robinson, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed May 15, 1974, Ser. No. 470,170
Int. Cl.² G05G *5/06*
U.S. Cl. 74—527 **12 Claims**

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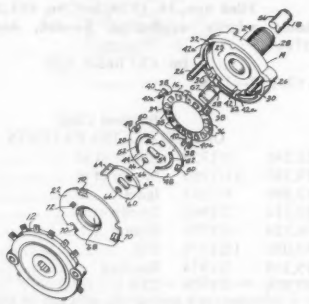
2,130,219	9/1938	Allison et al.	74/527
2,292,717	8/1942	Rubinstein	74/527
2,770,982	11/1956	Mastney et al.	74/527
2,840,672	6/1958	Martin	74/527
3,230,793	1/1966	Allison	74/511
3,584,163	6/1971	White	200/291



1. An indexing mechanism comprising a front plate with an annular flange, said flange being provided with a plurality of lug receiving notches and a plurality of ear receiving notches, a hill and valley insert disposed against the front plate, a plurality of ears extending radially from the insert, a pair of spaced arms perpendicularly extending from each of said ears, each of said ears and spaced arms engaging a respective one of said ear receiving notches and securing the hill and valley insert to the front plate, a rear plate having a plurality of lugs, each of the lugs engaging a respective one of said lug receiving notches and aligning the rear plate to the front plate, a shaft rotatably supported by the front plate, a detent spring biased between the front and rear plates and constrained to rotate with the shaft, said detent spring having at least one nubbin receiving opening, a spherical detent integral with the detent spring and engaging the hill and valley insert, a stop element constrained to rotate with the shaft, a nubbin projecting from the stop element and engaging the nubbin receiving opening of the detent spring, the nubbin reinforcing movement of the detent spring during rotation of the shaft and a stop projection integral with the rear plate, said stop element engageable with the stop projection for halting rotation of the shaft.

B 473,972

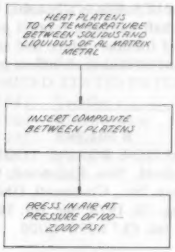
METHOD FOR BONDING COMPOSITE MATERIALS

Kenneth G. Kreider, Glastonbury, Conn., and Roy Fanti, Springfield, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 270,124, July 10, 1972, abandoned. This application May 24, 1974, Ser. No. 473,972
Int. Cl.² B23K *31/02*
U.S. Cl. 228—190 7 Claims

References Cited
UNITED STATES PATENTS

3,481,023	12/1969	Jost	29/504
3,606,667	9/1971	Kreider	29/423
3,615,277	10/1971	Kreider et al.	29/472.3


HEAT PLATENS TO A TEMPERATURE BETWEEN SOLIDUS AND LIQUIDUS OF AL MATRIX METAL
INSERT COMPOSITE BETWEEN PLATENS
PRESS IN AIR AT PRESSURE OF 100-2000 PSI

1. A process for rapidly densifying and diffusion bonding plasma sprayed aluminum matrix composites reinforced with a plurality of filaments comprising placing at least one composite tape having a plurality of unidirectional filaments selected from the group consisting of boron, silicon carbide, silicon carbide coated boron, boron carbide, alumina and carbon embedded in a plasma sprayed aluminum matrix between platens heated to a predetermined temperature, pressing said composite in air for 2–40 minutes between said heated platens at a pressure of 100–10,000 psi to densify said aluminum matrix, said temperature being at or below the solidus temperature of said aluminum matrix when said pressure is 2,000–10,000 psi and between the solidus and the liquidus temperature of said aluminum matrix when said pressure is 100–2,000 psi, said temperature and pressing time being sufficiently high, in combination with said pressure, to cause bonding of the aluminum matrix to said filaments without degradation.

B 480,604

METHOD FOR HANDLING WORKPIECES

Joseph R. Reilly, Naugatuck, Conn., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 424,866, Dec. 14, 1973, Pat. No. 3,880,301. This application June 19, 1974, Ser. No. 480,604
Int. Cl.² B65G *47/38*
U.S. Cl. 214—152 4 Claims

References Cited
UNITED STATES PATENTS

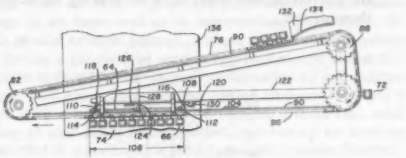
1,718,607	6/1929	Soubier	198/26 X
2,599,721	6/1952	Remington et al.	198/131 X
2,783,869	3/1957	Thurman	198/179
3,528,572	9/1970	Mosterd	214/60

1. A process for handling workpieces comprising:

A. sequentially loading workpieces into holders of individual carrier assemblies;

B. continuously moving said loaded carrier assemblies along a longitudinal path toward a discharge station,

C. simultaneously abruptly shifting a plurality of said holders at said discharge station to release positions while in said longitudinal path to discharge said workpieces from said carrier assemblies without stopping movement thereof;



D. continuing movement of the carrier assemblies away from the discharge station toward the loading station to receive additional workpieces; and

E. resetting said holders before arriving at said loading station.

B 491,501

ORAL IMPLANT

Robert Schwartz, 1271 Westfield Ave., Rahway, N.J. 07065

Filed July 24, 1974, Ser. No. 491,501
Int. Cl.² A61C *13/00*
U.S. Cl. 32—10 A 10 Claims

References Cited
UNITED STATES PATENTS

3,729,825	5/1973	Linkow et al.	32/10 A
3,787,900	1/1974	McGee	3/1.9
3,789,029	1/1974	Hodosh	128/92 C

1. An improved dental implant comprising an implant element fabricated from a biologically inert material, said implant element having an upper abutment and an interconnected lower substructure that is adapted to be placed upon or inserted within the alveolar bone of the maxillae or mandible, said substructure being provided with a reservoir or adherent coating of a calcium compound selected from the group consisting of calcium hydroxide, calcium oxide, calcium alcoholate, calcium salts of aliphatic monocarboxylic acids, calcium salts of aliphatic hydroxymonocarboxylic acids, calcium salts of aliphatic hydroxypolycarboxylic acids and mixtures thereof.

B 492,301

LATERAL SEMICONDUCTIVE DEVICE AND METHOD OF MAKING SAME

Joseph H. Dully, Cupertino, Calif., assignor to Varian Associates, Palo Alto, Calif.

Division of Ser. No. 372,464, June 21, 1973, abandoned. This application July 26, 1974, Ser. No. 492,301
Int. Cl.² B01J *17/00*
U.S. Cl. 29—580 9 Claims

References Cited
UNITED STATES PATENTS

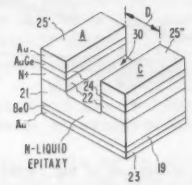
2,748,041	5/1956	Leverenz	29/580
3,381,182	4/1968	Thornton	29/576 E
3,820,236	6/1974	Haitz	29/580

1. In a method for fabricating a lateral type semiconductive device the steps of:

on an N+ type semiconductive wafer of sufficient thickness to be self-supporting, growing a thin N− type epitaxial layer of semiconductive material having a substantially lower N− type carrier concentration than said wafer,

depositing a barrier layer of electrically insulative material on said epitaxial material,

removing a layer of the wafer material from the side opposite said barrier layer, leaving a substantially thinned wafer, the composite of said thinned wafer, said epitaxial layer and said barrier layer being of sufficient thickness to be self-supporting depositing a layer of electrode material overlaying said wafer layer for making ohmic contact thereto; and



selectively removing areas of said layers of said electrode material and wafer material to define a pair of laterally spaced electrodes each making electrical connection to said epitaxially grown layer via an intervening layer of said wafer material.

B 497,021

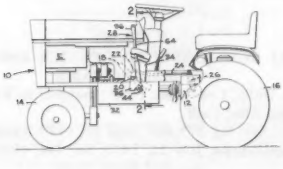
TRANSMISSION CONTROL BRAKE

Joseph A. Federspiel, Port Washington, Wis., assignor to FMC Corporation, San Jose, Calif.

Filed Aug. 13, 1974, Ser. No. 497,021
Int. Cl.[2] G05G *11/00, 5/06, 9/00*
U.S. Cl. 74—481 14 Claims

References Cited
UNITED STATES PATENTS

2,427,103	9/1947	Hettinger	74/531
2,867,133	1/1959	Ewing	74/531
2,971,397	2/1961	Bunting	74/531 X
3,505,896	4/1970	Phillips	74/481
3,727,482	4/1972	Geer	74/531
3,837,235	9/1974	Peterson	74/531



1. In a control mechanism for the hydrostatic transmission of a tractor of the type including a rocking foot pedal and a pedal support shaft rotatable by actuation of said pedal to indirectly alter the output torque, driving direction and speed of said transmission, the improvement comprising:

a. a quadrant fixed to said support shaft;

b. a locking rod pivotally connected to said support shaft and releasably connected to said quadrant for movement therewith;

c. a friction pad carried by said locking rod; and

d. a fixed braking surface slidably engaged by said friction pad for braking said support shaft to retain a given rotative position of said shaft when said foot pedal is released, said shaft being movable by pressure on said foot pedal.

13. A control mechanism for a driven hydrostatic transmission having an output member comprising: a rockable shaft having a neutral position; means connecting said shaft to the transmission for driving the output member at varying speeds in a first direction when the shaft is rotated different amounts in one direction past neutral, and for driving the output member at varying speeds in a second direction when the shaft is rotated different amounts past neutral in the opposite direction; a pedal connected to said shaft for rocking the shaft in either direction; a control lever journaled on said shaft; means for selectively latching or unlatching said lever from said shaft; friction means secured to the free end of said lever; means defining a friction braking surface adjacent said friction means; and resilient means for urging said friction means against said friction surface to maintain said shaft in any one of an infinite number of positions when said lever is latched to said shaft and said shaft has been rotated past neutral in one of said direction, said friction surface and said friction means preventing movement of said shaft unless pressure is applied to said foot pedal.

B 501,993

MACHINE BORING TOOL

Robert Wilfred Nashold, New Richmond, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

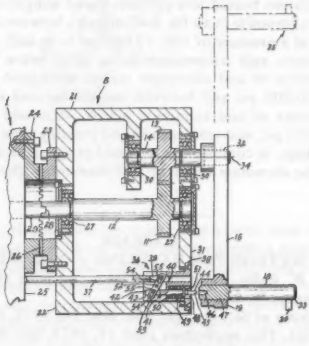
Filed Aug. 30, 1974, Ser. No. 501,993
Int. Cl.[2] B23B *43/00*
U.S. Cl. 408—124 5 Claims

References Cited
UNITED STATES PATENTS

3,555,963	1/1971	Evans	29/26 A X

FOREIGN PATENTS OR APPLICATIONS

1,947,630	4/1971	Germany	408/213
625,468	9/1961	Italy	408/124



1. In a machine tool utilizing interchangeable tool heads, the boring tool head comprising:

a. a housing, having an input face adapted to be received on a machine tool, and further having an output face disposed away from said input face on said housing;

b. an input shaft passing through said input face, rotatably mounted and centrally located within said housing;

c. an output shaft, passing through said output face, rotatably carried in said housing and displaced from said output shaft and drivingly connected thereto;

d. a boring arm, having one end connected to said output shaft and having the other end supporting a boring tool such that rotation of said output shaft causes said boring tool to swing in an arcuate path, wherein said arcuate

path extends beyond the perimeter of said housing when viewed along the axis of said arcuate path; and

e. a latching mechanism affixed to said housing and operable to maintain said boring arm in a predetermined angular position while transporting said tool head to and from a tool head storage matrix, and further operable to automatically release said boring arm for free rotation when said tool head is employed for use at a machining site.

B 502,540

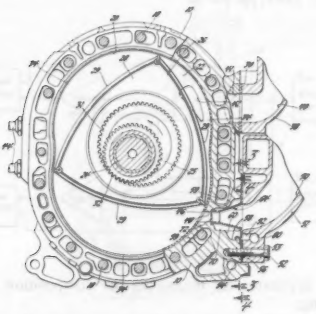
INTERNAL COMBUSTION ROTARY ENGINE OXIDIZING FLUID INJECTION ARRANGEMENT

Ronald F. Gillham, Huntington Woods, and Paul D. Stevenson, Ann Arbor, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 3, 1974, Ser. No. 502,540
Int. Cl.² F02B 75/10
U.S. Cl. 60—304 **2 Claims**

References Cited
UNITED STATES PATENTS

2,295,436	9/1942	Tendler	60/305
3,468,124	9/1969	Hraboweckyj	60/305
3,635,031	1/1972	Haddad	60/282
3,710,575	1/1973	Lamm	60/901
3,817,220	6/1974	Brumm	60/901



1. An internal combustion rotary engine having a stationary body comprising a rotor housing having a mutli-lobed internal peripheral wall and a pair of end wall housings having oppositely facing internal end walls cooperatively defining a cavity, a crankshaft rotatably mounted in said stationary body having an eccentric located in said cavity, a multi-lobed rotor rotatably mounted on said eccentric having sides opposite said end walls and a plurality of peripheral faces opposite said peripheral wall, means for causing said rotor and said crankshaft to turn in a fixed speed relationship while said rotor planetates with a fixed relationship to said rotor housing, said rotor faces and housing walls cooperating to provide a plurality of working chambers that are spaced about and move with said rotor within said rotor housing while varying in volume as said rotor planetates, said stationary body having an intake passage that is opened by said rotor to said chambers as they expand to deliver gas thereto, said rotor housing having an exhaust passage with a port at one end at said peripheral wall that is opened by said rotor to said working chambers during their contraction to receive exhaust gas therefrom and at the other end terminates at an external interface on said rotor housing, an exhaust manifold secured to said stationary body with an interface opposite said rotor housing interface, said exhaust manifold having a manifold passage registering with said exhaust passage in said rotor housing, a gasket arranged between said exhaust manifold and said rotor housing having an opening aligning with said manifold passage and said exhaust passage, means for securing said exhaust manifold to said rotor housing while clamping said gasket between said interfaces to seal the juncture of said manifold passage and said exhaust passage, said exhaust passage having a liner recess extending through said rotor housing interface and about said exhaust passage from an outer end at said other end of said exhaust passage to an inner end at an intermediate point along the length of said exhaust passage, a sheet metal exhaust passage liner having a gas passage section received in said recess that conforms in shape to the normal configuration of said exhaust passage, said gas passage section having an inner end that is spaced with a predetermined end clearance from said rotor housing at said inner end of recess and having an external surface that is spaced with a predetermined annular clearance thereabout from said rotor housing to provide an annular chamber between said liner and said rotor housing, said liner further having an annular flange at an outer end that is located in the opening of said gasket and is clamped directly between said interfaces of said rotor housing and said manifold to hold said liner in place while accurately determining said end clearance, said flange having outwardly located fingers that engage said rotor housing in said recess to accurately determine said annular clearance, said gas passage section of said liner having a throat portion adjacent said inner end of said recess, said throat portion having a plurality of peripherally spaced injection ports therethrough downstream of said end clearance, an oxidizing fluid supply passage in said exhaust manifold open through said opening in said gasket to said liner recess at said interfaces of said rotor housing and said exhaust manifold for delivering oxidizing fluid to said annular chamber whereby oxidizing fluid is delivered through said injection ports and also said end clearance to the exhaust gas flowing through said exhaust passage in directions transverse to the flow thereof while said liner also provides for warming of the oxidizing fluid prior to its injection into the exhaust gas and acts as a heat barrier between the exhaust gas and the rotor housing.

B 504,169

PRACTICE VIOLIN AND BOW

Robert H. Johns, 1555 Terwood Road, Huntingdon Valley, Pa. 19006

Filed Sept. 9, 1974, Ser. No. 504,169
Int. Cl.² G10D 1/02
U.S. Cl. 84—275 **7 Claims**

References Cited
UNITED STATES PATENTS

8,338	9/1851	Tilton	84/275
906,612	12/1908	Cayton	84/275
2,457,629	12/1948	Beckman	84/275
2,466,168	4/1949	Graydon	84/282
2,741,937	4/1956	Auville et al.	84/277 X
2,977,835	4/1961	Hornseth	84/275

FOREIGN PATENTS OR APPLICATIONS

6,340	4/1887	United Kingdom	84/275
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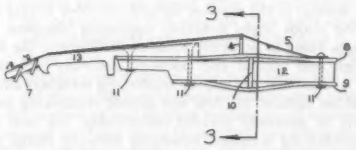

1. For introductory or practice purposes, a body for a violin-type stringed instrument having a neck and a tailpiece, comprising a pair of arched panels spaced approximately parallel to one another to form the top and bottom surfaces of the

body, a longitudinal rib separating the body panels, a pair of clamping means for securing at spaced localized areas said neck and said rib in longitudinal alignment, said top panel being fastened at one end by said pair of clamping means between said neck and said rib, said bottom panel being fastened at one end to said rib by at least one of said pair of clamping means, a third clamping means fastening said tailpiece and the other ends of said top panel, said rib, and said bottom panel, respectively, at a third localized area, said panels being otherwise unsupported and free at their peripheries, and a sound post positioned between the panels, the length of said post being sufficient to arch and separate the central portions of the panels from said rib.

4. A bow for a violin-type stringed instrument comprising a shaft having string retaining guide means at its extremities, bow strings wound around the shaft through the string retaining guide means in loops extending lengthwise of the shaft, and a spacer or frog slidably positioned between the shaft and the playing strings on one side of the shaft.

B 505,813
PLASTIC INJECTION MOLDING

Kenneth J. Puki, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 13, 1974, Ser. No. 505,813
Int. Cl.² E06B 3/20
U.S. Cl. 160—229 R **7 Claims**

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UNITED STATES PATENTS

2,272,227	2/1942	Thomas	52/619 X
2,952,313	9/1960	Stroup	160/229 R X
2,975,616	3/1961	Saunders	49/501 X
3,184,263	5/1965	Plegat	49/501
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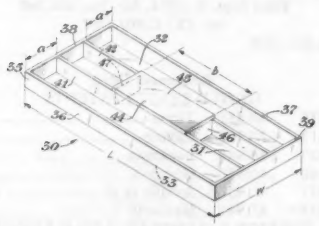
3,554,267	1/1971	Brinker	160/206 X
3,714,739	2/1973	Dolan	49/501
3,815,657	6/1974	Malek et al.	160/229 R
3,835,609	9/1974	Oscar	52/619 X



1. A foamed synthetic resinous plastic door, the foam plastic door having a generally rectangular configuration, the door having a finished or exposed surface and a nonexposed or hidden surface, the door having a peripheral flange portion of generally rectangular configuration extending away from and generally normal to the exposed surface, the door having first and second major edges generally oppositely disposed, the major edges being in generally parallel relationship, the door having first and second end portions generally oppositely disposed, at least first and second reinforcing members affixed to the hidden surface, the first and second reinforcing members being in generally parallel relationship, the first and second reinforcing members extending between flange portions at the first end portion and the second end portion, the reinforcing members being affixed to the nonexposed surface and adjacent flange portions, a plate-like member is disposed generally adjacent the nonexposed side and remote from the exposed side, the plate-like member affixed to and terminating at said reinforcing members at locations remote from nonexposed side and the plate-like planar member extending at least half the distance that the ribs extend, the plate-like member being generally centrally located relative to the door.

B 506,744
DUAL FREQUENCY ACOUSTIC GAS COMPOSITION ANALYZER

John E. Jacobs, Evanston, Ill., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Sept. 16, 1974, Ser. No. 506,744
Int. Cl.² G01N 29/02
U.S. Cl. 73—24 **4 Claims**

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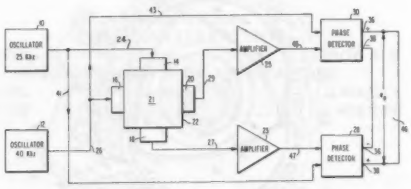
Staffin, *Control Engineering*, "*6 Ways to Measure Phase Angle*", *Oct., 1965, pp. 78–83.*



1. An apparatus for measuring the composition of a gas comprising:

a fixed length acoustical column containing the gas to be tested;

first and second variable frequency oscillator means for simultaneously generating respectively first and second different oscillating signals;

first and second transmitting transducer means, disposed on said column, for converting said first and second oscillating signals into mechanical energy;

first and second receiving transducer means disposed on said column for converting the mechanical energy produced by said transmitting transducer means into first and second electrical energy output signals, wherein said first transmitting transducer means is disposed on said acoustical column opposite said first receiving means, and said second transmitting transducer means is disposed on said acoustical column opposite said second receiving transducer means, and wherein said first and second transmitting means and said first and second receiving transducer means are disposed on said acoustical column in order to pass both acoustic beams across the same gap;

first phase detector means, connected to said first transmitting transducer and said first receiving transducer means, for measuring the phase shift in said first oscillating signal and generating a first phase shift output signal;

second phase detector means, connected to said second transmitting transducer and said second receiving transducer, for measuring the phase shift in said second oscillating signal and generating a second phase shift output signal; and

output means, connected to said first and second phase detector means, for summing said first and second phase shifts output signals.

B 512,547

RADIAL-FLOW TURBOMACHINE

Mason K. Yu, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 7, 1974, Ser. No. 512,547
Int. Cl.² F04D 17/00
U.S. Cl. 415—213 R 3 Claims

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3,155,046	11/1964	Vaughan	415/213 R
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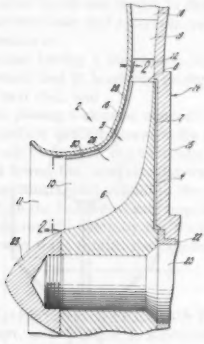
FOREIGN PATENTS OR APPLICATIONS

189,315	12/1966	U.S.S.R.	416/185



1. A radial-flow turbomachine including a rotor comprising a rotatably mounted body of circular cross-section having a hub portion and a disk portion extending radially from the hub portion, the disk and hub portions defining the inner boundary of an annular gas flow path through the rotor, the rotor also comprising an annular array of circumferentially spaced blades extending outwardly from the hub portion and forwardly from the disk portion, the blades extending from an annular gas inlet to an annular gas outlet and defining gas flow passages between them and being effective to transfer energy between the rotor and gas flowing through the passages, the blades each having a pressure face and a suction face in operation of the rotor, each blade having a free bounding edge remote from the rotor body extending along a course trending from near axial at one end of the gas flow passages to near radial at the other end of the gas flow passages, the turbomachine also including a stator enclosing the rotor and defining the gas inlet to and outlet from the rotor, the stator including a fixed rotor shroud extending continuously around the rotor closely adjacent to the free edges of the blades providing the outer boundary of the flow path through the rotor and acting to minimize leakage over the said free edges of the blades; wherein the improvement comprises a lip extending circumferentially of the rotor from the pressure face of each blade along the free edge of the blade with the outer surface of the lip extending closely parallel to the adjacent rotor shroud adapted to deflect gas flowing over the pressure face toward the said edge away from the pressure face toward the suction face of the blade at the opposite side of the passage and to obstruct leakage flow between the said edge of the blade and the rotor shroud into the adjoining passage.

B 512,745

ALL GLASS COMPOSITE BUILDING PANELS

Czeslaw Deminet, Kent, and Roger B. Gillette, Auburn, both of Wash., assignors to The Boeing Company, Seattle, Wash.

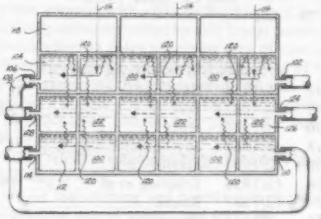
Continuation-in-part of Ser. No. 416,539, Nov. 16, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,745
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 2 Claims

References Cited
UNITED STATES PATENTS

504,544	9/1893	Van der Heyden	126/270 X
991,161	5/1911	McHenry	126/271 X
1,124,778	1/1915	Meuler	52/616
1,575,309	3/1926	Anderson	126/271
2,608,968	9/1952	Moseley	126/271
2,783,682	3/1957	Swenson	126/271 UX
2,998,005	8/1961	Johnston	126/270
3,102,532	9/1963	Shoemaker	126/270
3,107,052	10/1963	Garrison	126/271 X
3,192,575	7/1965	Rosenau et al.	52/171

FOREIGN PATENTS OR APPLICATIONS

1,138,992	1/1969	United Kingdom	52/616



1. An all glass building panel having a first enclosed space layer and a second enclosed space layer wherein:

a. the portion of said all glass building panel containing said first enclosed space layer comprises contiguous evacuated cells being comprised of;

a first outer glass plate,

first external glass walls fused to said first outer glass plate, one edge of said first external glass walls being fused to the circumferal edge of said first outer glass plate, said first external glass walls forming the closed external boundaries of said first enclosed space layer,

first internal glass walls fused to said first outer glass plate, one edge of said first internal glass walls being fused to said first outer glass plate within the boundaries of said first external glass walls to define the internal structure of said first enclosed space layer, and

a middle glass plate fused along its circumferal edge to the edge of said first external glass walls opposite the edge of said first external glass walls fused to said first outer glass plate and fused to the edge of said first internal glass walls opposite the edge of said first internal glass walls fused to said first outer glass plate; and,

b. the portion of said all glass building panel containing said second enclosed space layer comprises a serpentine path for liquid flow therethrough, said serpentine path having integral means for ingress and egress of liquid thereto and therefrom, said serpentine path having a membrane disposed therein for absorbing solar energy and transmitting said absorbed solar energy to the liquid disposed therein, said second enclosed space layer being comprised of;

second external glass walls fused to said middle glass plate, one edge of said second external glass walls being fused to the circumferal edge of said middle glass plate, said second external glass walls forming the closed external boundaries of said second enclosed space layer,

second internal glass walls fused to said middle glass plate, one edge of said second internal glass walls being fused to said middle glass plate within the boundaries of said second internal glass walls to define the internal structure of said second enclosed space layer, and

a second outer glass plate fused along its circumferal edge to the edge of said second external glass walls opposite the edge of said second external glass walls fused to said middle glass plate and fused to the edge of said second internal glass walls opposite the edge of said second internal glass walls fused to said middle glass plate.

B 520,928

SHEET METAL PISTON FOR TRANSMISSIONS AND METHOD OF MAKING A PISTON ASSEMBLY

James R. Martin, Ypsilanti, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 394,140, Sept. 4, 1973, Pat. No. 3,914,849, which is a division of Ser. No. 288,905, Sept. 14, 1972, Pat. No. 3,848,518. This application Nov. 5, 1974, Ser. No. 520,928

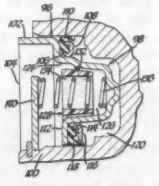
Int. Cl.² B23P *15/00*

U.S. Cl. 29—428 **3 Claims**

References Cited

UNITED STATES PATENTS

1,494,338	5/1924	Buckwalter	277/47
1,854,455	4/1932	Day	29/156.5 R
2,053,720	9/1936	Huck	92/130
2,549,818	4/1951	Joy	92/244
2,578,308	12/1951	Iavelli	92/107
2,766,864	10/1956	Schilling et al.	192/85 AA
2,815,684	12/1957	Roche	74/645
3,120,156	2/1964	Ayers, Jr.	92/108
3,321,056	5/1967	Winchell et al.	192/85 R
3,338,584	8/1967	Nakanishi et al.	277/186
3,370,682	2/1968	McFarland	192/85 AA
3,378,111	4/1968	Greer et al.	192/85 AA
3,532,030	10/1970	Margetts	29/156.5 R
3,733,920	5/1973	Annis	74/763
3,782,251	1/1974	LeMarchand	92/130



1. A method of making a sheet metal piston assembly for a friction drive establishing device comprising the steps of stamping a thin walled annular shell of substantially uniform thickness from sheet metal stock, forming inner and outer rims on said shell, seating annular elastomeric seal means on said shell adjacent to said rims for hydraulically sealing said shell in a piston bore, forming an annular axially extending channel in said shell between said rims, offsetting spaced portions of the bottom wall of said channel axially to provide pockets for piston return springs, forming a washer-like ring with spaced annular openings therein, inserting said ring into said channel, aligning said openings in said ring with said pockets in said channel, loading helical piston return springs through said openings of said ring into said spring pockets so that said springs are retained in said shell, and providing said outer rim of said shell with a contact surface for directly engaging the friction drive establishing device.

B 521,480

OUT-FLOW METERING DEVICE

Hans Frenken; Georg Schindler, both of Leverkusen, and Josef Friedsam, Langenfeld, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Nov. 6, 1974, Ser. No. 521,480

Claims priority, application Germany, Nov. 9, 1973, 2356010

Int. Cl.² B67D *5/08*

U.S. Cl. 222—67 **11 Claims**

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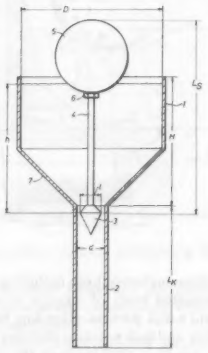
UNITED STATES PATENTS

421,559	2/1890	Cumberbatch	137/398 X
3,025,880	3/1962	Anderson	137/398 X



1. An outflow-metering device for a storage vessel for dispensing a constant stream of liquid per unit of time, comprising an outflow tube connected to the bottom of the storage vessel, a float and a metering element rigidly connected thereto which has a smaller diameter than the internal diameter of the outflow tube, the float being disposed in the storage vessel with the metering element disposed in the outflow tube, whereby the vertical position of the metering element in the outflow tube changes with the liquid level in the storage vessel and remains at a constant distance from the float to provide a substantially constant volume of flow of liquid from the outflow tube while sufficient liquid remains in the storage vessel to support the float.

B 529,156

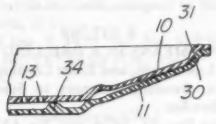
SELF-DRAINING SAUCER

John Florian, Bakersfield, Calif., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 3, 1974, Ser. No. 529,156
Int. Cl.² A47G *19/00*
U.S. Cl. 220—23.83 3 Claims

References Cited
UNITED STATES PATENTS

2,650,485	9/1953	La Greca	220/23.83
3,018,014	1/1962	Opolion	220/23.83 X
3,037,660	6/1962	Roehrig	220/23.83



1. A self-draining saucer or the like composed of two discs of like upwardly concave shape 1 of substantially equal diameter and coacting to form a unitary structure having an internal reservoir to receive liquid and means to drain liquid from the upper surface thereof into said reservoir, said saucer comprising the combination of:

a. an upper disc having a concentric wall on the bottom surface thereof and at least one perforation through the bottom of said disc; and

b. a lower disc having a circular concentric well defined by a bottom surface spaced downwardly from the concave surface of said lower disc and a circular wall on the upper face of said lower disc, said circular wall having an internal diameter substantially equal to the external diameter of said wall on the bottom of said upper disc and adapted to engage therewith, whereby the frictional engagement of said circular walls retains the combination.

B 533,056

DISC BRAKE CALIPER AND FRICTION PAD MOUNTING

James J. Colpaert, and William J. Kestermeier, both of 401 Bendix Drive, South Bend, Ind. 46634

Filed Dec. 16, 1974, Ser. No. 533,056
Int. Cl.² F16D *55/224, 65/02*
U.S. Cl. 188—73.6 1 Claim

References Cited
UNITED STATES PATENTS

3,261,430	7/1966	Wilson et al.	188/73.6
3,384,203	5/1968	Walther et al.	188/73.6
3,495,689	2/1970	Peach	188/72.4
3,525,420	8/1970	Honick et al.	188/72.4
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FOREIGN PATENTS OR APPLICATIONS

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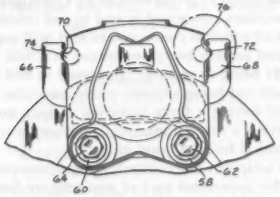


1. In a disc brake:

a rotor having a pair of friction faces;

a fixed support disposed adjacent said rotor;

a caliper slidably mounted on said fixed support for movement generally parallel to the axis of rotation of said rotor, said caliper including a fluid motor portion disposed adjacent one of said friction faces, an integral bridge member extending from said fluid motor portion and traversing the periphery of said rotor, and an inwardly extending portion extending from said bridge portion substantially parallel to the other friction face;

a pair of friction elements disposed adjacent each of said friction faces, each of said friction elements including a backing plate having a pair of circumferentially spaced edges, and a pair of radially separated edges interconnecting said circumferentially spaced edges, said bridge portion defining a pair of circumferentially spaced edges located radially outwardly from the circumferentially spaced edges of said friction elements;

said circumferentially spaced edges of said bridge portion defining torque receiving surfaces, one of said friction elements being disposed between said fluid motor portion and said one face of the rotor and having a pair of arms extending radially outwardly from the circumferentially spaced edges of said one friction element, said arms including a pair of facing edges defining a recess therebetween receiving said bridge portion, said arms further including torque transmitting surfaces cooperating with the torque receiving edges on said bridge portion to transmit braking torque generated by engagement of said friction element with said one friction face to said torque receiving surfaces carried by said bridge portion, said one friction element being otherwise free of restraint by said caliper and said torque member so that all of the braking torque generated by engagement of said one friction element with said one friction face is transmitted through a corresponding one of said arms to a corresponding torque receiving surface;

said other friction element being carried by said inwardly extending portion;

said torque transmitting and receiving surfaces comprising cooperating sets of splines and grooves;

said splines terminating short of the connection between the bridge member and the inwardly extending portion to define a gap between the end of each spline and said inwardly extending portion;

said other friction element when installed on said inwardly extending portion being adapted to engage said one friction element upon movement of the arm members toward their corresponding gaps to prevent movement of the arms into said gaps to thereby assure retention of said one friction element on said caliper.

B 535,386

DUAL HYDRAULIC MOTOR DRIVE SYSTEM

Larry G. Eftefield, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 23, 1974, Ser. No. 535,386
Int. Cl.² F15B *11/16*
U.S. Cl. 60—425 7 Claims

References Cited
UNITED STATES PATENTS

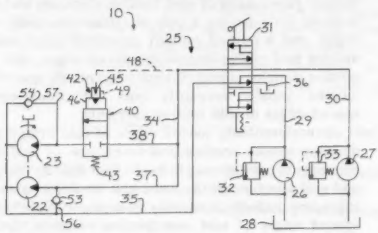
2,370,526	2/1945	Doran	60/425
2,374,588	4/1945	Doran	60/425
2,643,516	6/1953	Carlson	60/486 X
3,129,781	4/1964	Stein	60/426 X
R27,334	4/1972	Zimmerman	60/486 X

4. A dual hydraulic motor drive system for driving a material loading elevator for a self-loading scraper vehicle, comprising:

a source of fluid pressure;

first and second hydraulic motors drivingly connected to said elevator;

a fluid circuit for selectively communicating said source of fluid pressure to said motors including a blocker valve movable between a first position for blocking fluid to one of said motors so that said elevator is operatively driven solely by the other of said motors at a high speed, low torque setting and a second position for directing fluid to both of said motors to operatively drive said motor at a low speed, high torque setting; and



means for automatically shifting said blocker valve between its first and second positions including a pair of actuators for shifting said blocker valve towards its second position, with one of said actuators being continually responsive to loading resistance on the elevator to shift said blocker valve to its second position when the loading resistance increases to a predetermined relatively high level, and the other of said actuators being responsive to loading resistance only when said blocker valve is in its second position to assist said one actuator so that the blocker valve is held in its second position until such time that the loading resistance subsides to a level substantially lower than said high level.

B 535,928

INTEGRATED THERMAL ANTI-ICING AND ENVIRONMENTAL CONTROL SYSTEM

Anil D. Shah, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 23, 1974, Ser. No. 535,928

Int. Cl.² B64D *15/02, 13/08*

U.S. Cl. 244—134 R **3 Claims**

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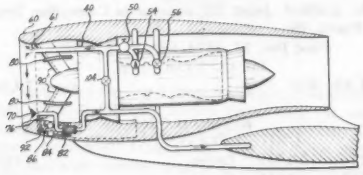
UNITED STATES PATENTS

2,594,118	4/1952	Boyd	415/178 X
2,712,727	7/1955	Morley et al.	244/134 R X
2,777,301	1/1957	Kuhn	244/59 X
3,341,114	9/1967	Larson	60/39.09 D



1. An integrated thermal anti-icing and environmental control system for use on aircraft having a wing, a passenger cabin, a gas turbine powerplant, an inlet supplying air to the powerplant and an acoustic ring mounted with said inlet comprising:

a source of hot, compressed air;

first means connected to the source for distributing a portion of the air within the wing for anti-icing purposes;

second means connected to said source for distributing a second portion of the air within the inlet for anti-icing purposes and for cooling that portion of the air to a predetermined maximum temperature;

a heat exchanger connected to the second means;

a liquid;

closed-loop means for circulating the liquid through the heat exchanger and the acoustic ring;

environmental control means connected to said heat exchanger for conditioning and pressurizing air for the passenger cabin.

B 537,709

COUPLING MEANS IN A DRILLING MACHINE

Hans Per Olof Lundstrom, and Ernst Lennart Johansson, both of Sandviken, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed Dec. 31, 1974, Ser. No. 537,709

Int. Cl.² B25D *9/00*

U.S. Cl. 173—104 **5 Claims**

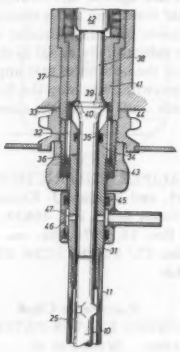
References Cited

UNITED STATES PATENTS

1,203,860	11/1916	Dunbar	175/173
1,869,892	8/1932	Grove et al.	175/173
3,416,615	12/1968	Grospas	175/173

FOREIGN PATENTS OR APPLICATIONS

959,955	6/1964	United Kingdom	175/173



1. A rock drilling equipment of the character having an impact and rotary force-transmitting device for use with a percussive type drill motor having a reciprocal piston delivering percussive force, said equipment comprising:

a rotatable tube (**11**), said tube being composed of a plurality of sections connected in end to end relation, one end section of which is connected to said drill motor and the other end section being connected to a drill bit;

a rod (**10**) being in sections connected in end to end relation, said rod being slidable within said tube, one end of said rod having a force-receiving surface and the other end having a force-transmitting surface to transmit only longitudinal forces to said bit;

a tubular adapter (**31**) in interlocking connection with said tube, the uppermost part of said adapter being received in a tubular casing and enclosing an uppermost rod section (**36**), the latter being adapted to transmit percussion force from said reciprocal piston (**42**) to said drill bit,

said adapter being provided with longitudinally extending connection means (32) around its circumference; and

a coupling member (33), rotatable by said drill motor, said coupling member being provided with corresponding connection means to mate circumferentially with said adapter within said casing for transmitting only rotary motion to said tube and said bit,

said mating being effected with clearance such that said tube is able to take angular positions relative to said casing.

B 537,990

MEAT TRAY

John Florian, Bakersfield, Calif., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 2, 1975, Ser. No. 537,990

Int. Cl.² B65D *1/36, 81/26*

U.S. Cl. 229—2.5 **6 Claims**

References Cited

UNITED STATES PATENTS

1,866,035	7/1932	Hart et al.	229/2.5
3,337,110	8/1967	Commisso et al.	229/29 M
3,346,400	10/1967	Roesmer	229/2.5
3,420,431	1/1969	Donovan	229/2.5
3,485,434	12/1969	Donovan et al.	229/2.5
3,778,516	12/1973	Cornelius	229/2.5 X
3,834,606	9/1974	Andersson	229/2.5

1. A tray particularly suited to packaging of cut meats comprising a flat rectangular bottom wall having rounded corners, side walls integral with said bottom wall disposed upwardly and flared outwardly of said bottom wall, each of said side walls being integral with adjacent side walls at the curved corners of said tray, an integral flange extending outwardly of said side walls at the upper edges thereof, said side walls being formed with flutes transversely of said walls from the bottom wall to said flange, the curved corner surfaces at joinder of said side walls being formed as an upper portion adjacent said flange in a smooth curve to which said side walls are tangent and a lower portion in a smooth curve of curvature reverse to that of said upper portion to thereby provide a fluted corner terminating at a shoulder between said portions.

B 540,632

KEY RETAINING DEVICE

Charles F. A. Laitner, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 13, 1975, Ser. No. 540,632

Int. Cl.² F16B *3/00*

U.S. Cl. 403—318 **3 Claims**

References Cited

UNITED STATES PATENTS

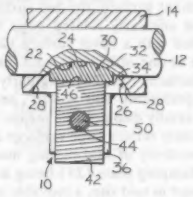
164,609	6/1875	Thomas	403/318
368,744	8/1887	Woodruff	403/358
476,911	6/1892	Westwood	403/358
661,079	11/1900	Rohrbeck	403/344 X
3,009,719	11/1961	Otto et al.	403/252
3,376,064	4/1968	Jackson	297/391

1. A key retaining device comprising,

an elongated shaft with a notch formed therein,

a tubular member fully encirclingly journalled on said shaft and having a radial slot extending through the outer periphery thereof with closing end walls formed therethrough alignable with said notch,

a pair of ears secured to the outer periphery of said tubular member in radially outwardly extending relation on opposite sides of said slot,



a key insertable in said notch and in said slot to lock said shaft and said tubular member together,

a key retaining plate radially inwardly disposable against said key, and

fastener means operatively associated with said ears to deflectably bias them together for clamping the key retaining plate therebetween, maintaining said key in its locked condition and for transferring force across said slot in said tubular member.

B 546,911

CUTTING INSERT AND CUTTING TOOL

Axel Sven Olof Roos; Kurt Heinrich Albert Erich Faber, and Sven Axel Olof Wirfelt, all of Sandviken, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed Feb. 4, 1975, Ser. No. 546,911

Claims priority, application Sweden, Feb. 8, 1974, 74016791

Int. Cl.² B26D *1/00*

U.S. Cl. 29—96 **9 Claims**

References Cited

UNITED STATES PATENTS

3,124,864	3/1964	Frommelt et al.	29/96
3,156,031	11/1964	Lundgren	29/96
3,220,088	11/1965	Brundin et al.	29/96
3,611,525	10/1971	Cochran	29/95
3,754,309	8/1973	Jones et al.	29/96
3,775,818	12/1973	Sirola	29/96

FOREIGN PATENTS OR APPLICATIONS

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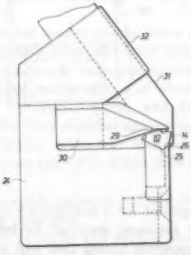

1. A tool holder and cutting insert combination consisting of a tool holder (24) and a cutting insert (10), said insert having a main cutting edge (12) and a secondary cutting edge (13) with a curved cutting tip portion (11) therebetween, the

insert having around its circumference several edge surfaces extending parallel to the main cutting edge two of which edge surfaces, (15) and (16), being angularly interrelated and constituting bottom supporting surfaces, said surfaces forming an angle of 90° – 130°, preferably 100° – 120°, with each other, a third said edge surface constituting a clearance face for the main cutting edge, the insert having two opposite end surfaces, (18) and (19), one of which constituting the clearance face of the secondary cutting edge and the other constituting an end abutment surface, the top surface (20) being located opposite said angularly related edge surfaces (15, 16) and being provided with a bevel surface (23), said holder having an insert site at one of its ends, said insert site having bottom supporting surfaces (25, 26), angularly related at an angle of 90° – 130°, preferably 100° – 120°, and a side support, provided on an axially displaceable means in the holder, engaged by said angularly relates edge surfaces and said end abutment surface respectively of said cutting insert positioned therein, a movable clamping plate (29) being arranged for the clamping of the insert in said site, a movable arm (30) being secured to said clamping plate, said clamping plate being positioned over said insert and engageable with the bevel surface (23) thereof for pressing the insert against said bottom surfaces (25, 26) upon actuation of said arm by said axially displaceable means in the holder.

B 548,155

DIE SEGMENT FOR BRIQUETTING ROLL

William D. Armbrust, Greensburg; Dennis J. Shallenberger, Latrobe, and Charles E. Hill, Whitney, all of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Division of Ser. No. 455,518, March 28, 1974, Pat. No. 3,883,282. This application Feb. 7, 1975, Ser. No. 548,155

Int. Cl.² B29C *3/02*

U.S. Cl. 249—135 **9 Claims**

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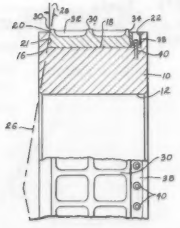
3,077,634	2/1963	Komarek et al.	425/237
3,829,267	8/1974	Woodward	425/237



1. A die segment for a briquetting roll comprising; a body of hard wear resistant material having end edges and side edges and oppositely facing first and second major surfaces, one major surface having pocket means formed therein, the other major surface being disposed in a first flat plane, one side edge being disposed in a second flat plane at an angle to said first plane, and the other said side edge being in the form of an angular segment of an annular section of a cone.

B 551,527

TRACTOR HAVING TRANSMISSION-DRIVEN POWER TAKE-OFF

Saul Herscovici, Waterloo, and Lawrence Vernon Anderson, Cedar Falls, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Feb. 21, 1975, Ser. No. 551,527

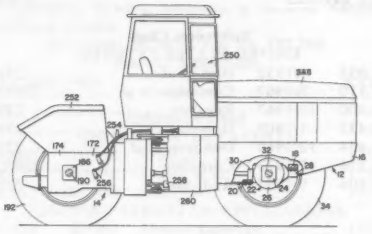
Int. Cl.² B60K *17/28*

U.S. Cl. 180—53 R **8 Claims**

References Cited

UNITED STATES PATENTS

3,701,393	10/1972	Lemons et al.	180/51
3,774,460	11/1973	Browning et al.	74/740 X
3,774,474	11/1973	Recker et al.	74/740
3,774,475	11/1973	Meysenburg et al.	74/740



1. A tractor including a wheel supported chassis, an engine supported on the chassis, variable ratio transmission means supported on the chassis and coupling the engine to at least a pair of wheels, operator control means for varying the ratio of the transmission means, a PTO shaft supported on the chassis, and means including clutch means coupling the PTO shaft to the engine, characterized in that the variable ratio transmission means includes a first section having first and second ratio conditions and a second section having a plurality of ratio conditions, the means coupling the PTO shaft to the engine is coupled to the transmission means between the first and second sections, and the tractor further includes means responsive to engagement of the clutch means to override the operator control means and shift the first section to and/or hold the first section in its first ratio condition.

B 555,772

HOPPER CAR DOOR ACTUATING MECHANISM

Roy W. Miller, 2545 Lincoln St., Highland, Ind. 46322

Filed Mar. 6, 1975, Ser. No. 555,772

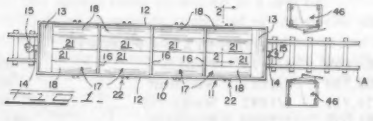
Int. Cl.² B65G *67/24*

U.S. Cl. 214—58 **8 Claims**

References Cited

UNITED STATES PATENTS

3,314,558	4/1967	Dorey	214/63
3,459,317	8/1969	Shaver	214/63



1. For a railway hopper car having a body structure and a hopper, bottom door dump means for discharging material from said hopper in an open position,

door actuating mechanism for moving said door between open and closed positions including a bell shaped crank arm pivotally mounted on said structure and having an arm position pivotally connected to said door, cam follower means on said arm, the improvement comprising;

a cam structure positioned adjacent a railway track on which said car is travelling, said structure including a base having an upright pedestal,

a horizontal cam member supported on said pedestal and including a vertical cam surface,

said cam follower means during movement of said car engaging said vertical cam surface whereby said arm is pivotally moved and said door is opened,

a second auxiliary cam supported on said pedestal, and including a second vertical cam surface and second follower means on said arm engaging said second cam during engagement between said first cam follower and said first cam whereby an additional force is initiated to pivot said arm to said open position of said door means.

B 556,057

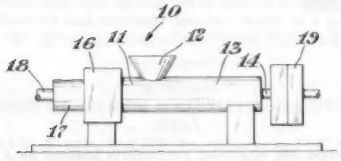
INJECTION MOLDING MACHINE AND METHOD OF OPERATION THEREOF

Robert H. Ritzie, Mystic, Conn., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 6, 1975, Ser. No. 556,057
Int. Cl.² B29B *1/06*
U.S. Cl. 259—191 **5 Claims**

References Cited
UNITED STATES PATENTS

3,175,248	3/1965	Swenson	259/191
3,712,594	1/1973	Hensen	259/9
3,737,151	6/1973	Schaeffer	259/191
3,746,318	7/1973	Schippers	259/191



1. In a reciprocating screw injection molding machine, the molding machine comprising a barrel having a rotating forwarding extruder screw therein the screw having at least one forwarding flight, means to reciprocately position the screw within the barrel and means to heat plastify synthetic resinous thermoplastic materials within the barrel, the improvement which comprises the screw having a feed zone adjacent the feed end, a first compression zone adjacent the feed zone and disposed toward a discharge end of the screw, a decompression zone disposed adjacent the first compression zone and remote from the feed zone, a second compression zone disposed at the discharge end of the screw and adjacent the decompression zone, at least one passage defined within the screw providing a path between the decompression zone and the discharge end of the screw, a valving means to selectively open or close the passage within the screw.

B 558,251

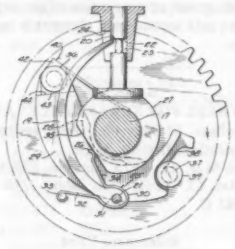
AUTOMATIC COMPRESSION RELIEF MECHANISM FOR INTERNAL COMBUSTION ENGINES

Joseph R. Harkness, Germantown, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Mar. 14, 1975, Ser. No. 558,251
Int. Cl.² F01L *13/08*
U.S. Cl. 123—182 **9 Claims**

References Cited
UNITED STATES PATENTS

3,314,408	4/1967	Fenton	123/182
3,362,390	1/1968	Esty	123/182
3,469,922	2/1970	Campen	123/182
3,511,219	5/1970	Esty	123/182
3,620,203	11/1971	Harkness	123/182
3,897,768	8/1975	Thiel	123/182
3,901,199	8/1975	Smith	123/182



1. In an internal combustion engine having a valve which controls flow of gas through a port communicable with the engine combustion chamber, and valve actuating means by which the valve is moved axially between its seat and an open position, and wherein said valve actuating means comprises a valve spring biasing the valve for closing motion towards its seat, a camshaft rotatable in timed relation to the engine cycle, and means comprising an axially movable part connected with the valve and a cam constrained to rotate with the camshaft for cyclically moving the valve in the opening direction, automatic compression relief mechanism whereby the valve is prevented from getting nearer to its seat than a predetermined small distance therefrom at engine cranking speeds but is permitted to engage its seat normally at engine running speeds, said mechanism comprising:

A. a latch member;

B. mounting means confining the latch member to motion substantially transverse to the direction of movement of said part, between defined latching and inoperative positions;

C. cooperating abutment means on the latch member and on said part, engageable when the latch member is in its latching position to restrain the valve against movement through said distance to its seat, said abutment means cooperating with the valve spring and the mounting means to confine the latch member against movement out of its latching position whenever the valve actuating means tends to dispose the valve at less than said distance from its seat;

D. a cam follower movable between defined latch enabling and latch disabling positions;

E. means providing a resilient lost motion connection between the cam follower and the latch member whereby movement of the cam follower from its latch enabling position to its latch disabling position biases the latch member away from its latching position and motion of the cam follower from its latch disabling position to its latch

enabling position biases the latch member away from its inoperative position; and

F. cam means cooperable with the cam follower to dispose the same in its latch enabling position only when the engine is at cranking speeds, and then only during a minor portion of the engine cycle that begins during closing motion of the valve and at a time when the valve is more than said distance from its seat, and to dispose the cam follower in its latch disabling position at all other times, said cam means comprising

1. a first cam element constrained to rotate with the camshaft and which is arranged to engage the cam follower through all but said minor portion of every engine cycle, and

2. a centrifugally responsive second cam element which is complementary to the first cam element and which is carried by the camshaft for rotation therewith and for motion relative thereto between a pair of defined positions, towards one of which it is biased and towards the other of which it is centrifugally propelled, said second cam element being arranged to engage the cam follower during said minor portion of the engine cycle, but only when said second cam element is in one of its said positions.

B 558,818

SPROCKET WHEEL FOR SCRAPER ELEVATOR DEVICE

Raymond P. Dellner, Strongsville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

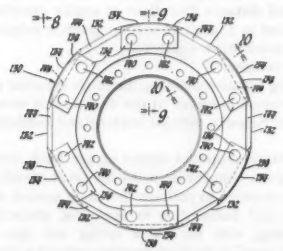
Filed Mar. 17, 1975, Ser. No. 558,818
Int. Cl.² F16H *1/00*; B60P *1/36*
U.S. Cl. 74—243 C **3 Claims**

References Cited
UNITED STATES PATENTS

2,322,967	6/1943	Perry	74/231 C
2,803,504	8/1957	Lynch	74/231 C
2,984,120	5/1961	Hurry	74/229
3,161,280	12/1964	Creighton	198/174
3,206,876	9/1965	Penote et al.	74/243 R
3,416,385	12/1968	Schenk	74/243 R
3,758,966	9/1973	Miller	37/8
3,831,358	8/1974	Marsh et al.	74/231 J
3,899,219	8/1975	Boggs	74/243 R

FOREIGN PATENTS OR APPLICATIONS

2,011,781	9/1971	Germany	74/243 R



1. A sprocket wheel for an elevator device adapted to be mounted in the open front end of a scraper bowl and including a flexible endless belt member having a plurality of teeth rigidly connected to the inner surface of the belt member, said sprocket wheel comprising a disc having a plurality of planar surfaces and arcuate surfaces alternately formed along the periphery thereof, the planar surfaces being of equal longitudinal length and said arcuate surfaces having chords of equal length, a pair of driver members spaced laterally from the disc and located adjacent to and on opposite sides of each of said arcuate surfaces, and means rigidly connecting said driver members to said disc whereby said driver members transmit drive to the teeth of the belt member when the sprocket wheel is driven.

B 562,698

FRICTION DISC APPARATUS

Warren D. Chambers, 717 Bendix Drive, South Bend, Ind. 46620

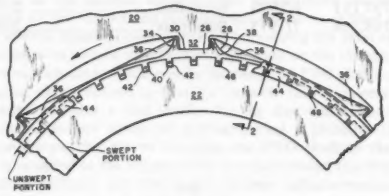
Filed Mar. 27, 1975, Ser. No. 562,698
Int. Cl.² F16D *65/12*
U.S. Cl. 188—218 XL **13 Claims**

References Cited
UNITED STATES PATENTS

2,989,153	6/1961	Boulet	188/218 XL
3,465,860	9/1969	Gingery	192/70.16
3,473,637	10/1969	Rutt	192/107 R
3,478,850	11/1969	Abu-Akeel	192/107 R X
3,650,357	3/1972	Nelson et al.	188/71.5
3,747,712	7/1973	Stout	188/73.2
3,891,066	6/1975	Anderson	188/218 XL X
3,892,293	7/1975	Dowell	188/73.2 X

FOREIGN PATENTS OR APPLICATIONS

1,140,969	8/1957	France	188/218 XL



1. Friction disc apparatus particularly adapted for a brake used in retarding rotation of a wheel comprising:

an annular carbon or carbon based friction disc having frictionally swept and unswept annular areas;

an annular metal ring concentric with said annular friction disc and arranged contiguous to one of the two radially spaced apart peripheral edge portions thereof;

a plurality of circumferentially spaced apart lug members formed on said ring and extending radially therefrom into engagement with a plurality of mating circumferentially spaced apart slots in said one peripheral edge portion;

a plurality of circumferentially spaced apart force transmitting members formed on said ring and extending radially therefrom in opposition to said lug members;

first and second axially spaced apart annular metal plate members fixedly secured to said ring and extending therefrom to overlay the major portion of said unswept annular area;

said annular metal ring and said first and second annular plate members providing a force distributing medium for said friction disc as well as a shield to minimize oxidation of said unswept annular areas.

B 567,058

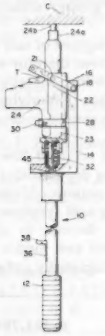
EXTENSION ATTACHMENT DEVICE FOR A POWER TOOL

Vernon P. Steele, 22 Fairview Terrace, Glenville, Conn. 06830

Filed Apr. 11, 1975, Ser. No. 567,058
Int. Cl.² B23B *45/00*
U.S. Cl. 173—170 **9 Claims**

References Cited
UNITED STATES PATENTS

2,643,088	6/1953	Hornack	173/170 X
2,730,803	1/1956	Kimball	30/296 X
3,086,574	4/1963	Ustin	173/170 X
3,272,267	9/1966	Langas	173/170
3,805,385	4/1974	Ritums et al.	30/DIG. 1



1. An extension attachment device for a power tool having an operating means and comprising an elongated pole provided with a handle at one end and an element at the other end having a pivotable member, a stationary support member provided with means for removably securing a power tool thereon, resilient means positioned between said pole and said stationary support and operatively connecting said pole and said stationary support whereby said pole is capable of linear movement upon the application of force in a predetermined direction and said pivotable member pivots to a position in which the operating means of said power tool is actuated.

B 569,646

METHOD OF FEEDING MATERIAL TO A CONVEYOR BELT

Richard H. Kressly, Red Hill, Pa., assignor to FMC Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 391,422, Aug. 24, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 569,646
Int. Cl.² B65G *15/00*
U.S. Cl. 198—129 **4 Claims**

References Cited
UNITED STATES PATENTS

2,326,098	8/1943	Kimmich	198/203
2,917,207	12/1959	Prowse et al.	198/39 X

1. The method of feeding material onto a conveyor belt of substantial length traversing irregular terrain and having a motor to drive the belt, said belt having vertical concave curves because of undulations and dips in the terrain, the method comprising the steps of starting the belt, feeding the material at a feed point to the belt at a reduced rate to deposit on the belt a reduced layer of material having a leading edge, increasing the feed of material to the belt to deposit a full load of material on the belt after the leading edge of the reduced layer of material has entered the extreme downstream vertical curve of the belt.

B 580,921

NOZZLE

Alain Frochaux, Boston, Mass., assignor to Barry Wright Corporation, Watertown, Mass.

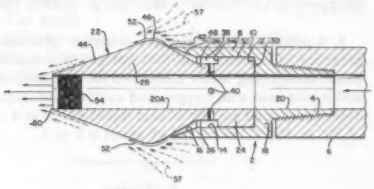
Continuation-in-part of Ser. No. 500,647, Aug. 26, 1974, abandoned. This application May 27, 1975, Ser. No. 580,921
Int. Cl.² B05B *7/08;* **F01N** *1/10, 1/14*
U.S. Cl. 239—424 **23 Claims**

References Cited
UNITED STATES PATENTS

2,293,181	8/1942	Terman	181/71 X
2,334,263	11/1943	Hartwell	181/42 X
2,797,964	7/1957	Alexander	239/422 X
3,117,726	1/1964	Schoberg	239/291
3,318,534	5/1967	Stolteben	239/291
3,589,383	6/1971	Garnier	239/DIG. 7
3,628,737	12/1971	Norton	239/DIG. 7
3,735,778	5/1973	Garnier	239/DIG. 7
3,794,137	2/1974	Teodorescu et al.	239/DIG. 7
3,795,288	3/1974	Pall	181/71 X
3,859,205	1/1975	Reba et al.	239/DIG. 7

FOREIGN PATENTS OR APPLICATIONS

1,408,538	7/1965	France	239/291



1. A high-thrust low-noise nozzle adapted to effect movement of a secondary fluid by a pressurized primary fluid comprising, tubular means forming a passageway having an entrance and an exit orifice, said entrance being adapted for connection to a source of pressurized primary fluid, at least one port communicating with the passageway between said entrance and exit orifice, means cooperating with said port for directing flow of primary fluid from said port in a direction so as to induce flow of a secondary fluid along the outside of said tubular means toward said exit, and noise-reducing means positioned in said passageway between said exit orifice and said port, said noise-reducing means creating sufficient back pressure to force some of the pressurized pirmary fluid to flow out of said passageway via said port.

CHEMICAL APPLICATIONS

B 160,099

METHOD FOR PREPARING RECEPTOR SHEET FOR USE IN PHOTOGRAPHIC DIFFUSION PROCESS

Terence William Baldock, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 6, 1971, Ser. No. 160,099

Claims priority, application United Kingdom, July 7, 1970, 32975/70

Int. Cl.² B44D *1/44;* **C08H** *19/00*

U.S. Cl. 427—343 **3 Claims**

References Cited

UNITED STATES PATENTS

3,532,497	10/1970	Goffe	96/29
3,647,440	3/1972	Rasch	96/29

1. A method for preparing a receptor sheet for use in the photographic silver salt diffusion process, said method comprising preparing a silver halide photographic emulsion of controlled silver halide grain size, coating said emulsion as a layer on a substrate, and converting said silver halide to silver sulfide by treatment with a sulfiding agent.

B 208,916

MANUFACTURE OF ACETALDEHYDE

William D. Schaeffer, Pomona, and Kenneth L. Olivier, Placentia, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Continuation of Ser. No. 572,899, Aug. 17, 1955, abandoned. This application Dec. 16, 1971, Ser. No. 208,916

Int. Cl.² C07C *47/06*

U.S. Cl. 260—601 R **5 Claims**

References Cited

UNITED STATES PATENTS

3,119,874	1/1964	Paszthory et al.	260/597

OTHER PUBLICATIONS

Bobtelsky et al., J. Am. Chem. Soc. Vol. 64, pp. 1462–1468 (1942).

Jones et al., J. Chem. Soc. pp. 4757–4761 (1961).

Marette et al., "Chem. Abst." 48, p. 4941g (1954).

Bhargova et al., "Chem. Abst." 63, p. 11291b (1965).

1. A process for the selective oxidation of oxalic acid in the presence of acetaldehyde that comprises contacting a liquid phase comprising water, acetaldehyde, a strong mineral acid and oxalic acid with oxygen and catalytic amounts of a vanadium compound soluble in said liquid phase at a temperature of 30° to 300°C. and a pH of about 0.5 to 3.

B 359,901

PHOTOGRAPHIC METHOD EMPLOYING ORGANIC LIGHT-SCATTERING PARTICLES FOR PRODUCING A VIEWING-SCREEN STRUCTURE

Theodore Alexander Saulnier, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed May 14, 1973, Ser. No. 359,901

Int. Cl.² G03C *5/00*

U.S. Cl. 96—36.1 **3 Claims**

References Cited

UNITED STATES PATENTS

3,589,907	6/1971	Dijkstra	96/36.1
3,623,867	11/1971	Saulnier	96/36.1
3,661,580	5/1972	Mayaud	96/36.1

1. A method for producing a luminescent screen structure including the steps of

a. coating a supporting surface with a film consisting essentially of (i) organic polymeric binder material whose solubility in a given solvent is altered when it is exposed to radiant energy, said binder material being volatilized when heated in air below about 500°C and (ii) about 10 to 80 weight percent with respect to the weight of said binder material of particles of an organic material that is insoluble in said binder material and selected from the group consisting of acrylic and polystyrene polymers, said particles being volatilized when heated in air at temperatures below about 500°C and being about 0.3 to 1.0 micron median size, said organic particles being adapted to scatter said radiant energy in said film,

b. exposing said film to an image in the form of said radiant energy until the solubility of the irradiated portions thereof is selectively altered, thereby producing in said film regions of greater solubility and regions of lesser solubility,

c. removing those regions of said film with greater solubility with a liquid solvent therefor while retaining said regions with lesser solubility, thereby baring the areas of said supporting surface underlying said regions of greater solubility, while retaining those regions of said film of lesser solubility,

d. then, while said retained film regions are wet with said solvent, adhering dry particles of screen-structure material to said film regions of lesser solubility,

e. and then baking said retained film regions with said adhered particles thereon in air at temperatures below about 500°C until said binder material and said organic particles are substantially entirely volatilized.

B 381,709

CHEMICAL VAPOR DEPOSITION OF LUMINESCENT FILMS

Steven Alan Lipp, Cranbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 23, 1973, Ser. No. 381,709

Int. Cl.² B05D *5/12*

U.S. Cl. 427—70 **10 Claims**

References Cited

UNITED STATES PATENTS

3,018,194	1/1962	Norman et al.	117/107
3,113,040	12/1963	Winston	117/33.5 E
3,178,308	4/1965	Oxley et al.	117/106
3,297,414	1/1967	Mazdiyasni et al.	23/345
3,356,527	12/1967	Mashier et al.	117/107.2 R
3,356,703	12/1967	Mazdiyasni et al.	260/429.2
3,372,297	3/1968	Pearsall et al.	313/317
3,434,863	3/1969	Hansen et al.	117/33.5 E
3,449,148	6/1969	Shortes	117/106 R
3,485,666	12/1969	Sterling	117/106 R
3,518,115	6/1970	Pammer et al.	117/106 R
3,567,505	3/1971	Harrington	117/33.5 E
3,594,216	7/1971	Charles et al.	117/107.2 R
3,634,477	1/1972	Chattoraj et al.	117/107.2 R
3,647,525	3/1972	Naber	117/106 R
3,894,164	7/1975	Dismukes et al.	427/248

FOREIGN PATENTS OR APPLICATIONS

1,104,448	2/1968	United Kingdom	313/467
702,575	1/1954	United Kingdom	427/70

1. A method for depositing a luminescent film upon a nonreactive substrate comprising

a. vaporizing into a nonreactive carrier gas (1) at least one member of a first group consisting of hydrides and alkyls of M^1, wherein M^1 is at least one of silicon, germanium, boron, phosphorus and aluminum, (2) at least one volatile M^2-containing organo-metallic compound of a second group, wherein M^2 is at least one of zinc, cadmium, magnesium, calcium, beryllium, strontium, and barium, and (3) at least one volatile M^3-containing organo-metallic

compound of a third group wherein M^3 is at least one activator for said film,

b. heating said substrate to temperatures in the range of about 300° to 700°C,

c. contacting the vapor-laden carrier gas and an oxidizing gas with said heated substrate,

d. and continuing steps (a), (b) and (c) for a time interval sufficient to cause the substrate to be coated with a luminescent film consisting essentially of a phosphor having the formula

$$M^1{}_aM^2{}_bO_c{:}dM^3$$

wherein M^1, M^2, and M^3 are as defined above, *a*, *b* and *c* are values in moles normally used to provide the desired host crystal for the phosphor and *d* is an activator proportion generally in the range of 0.001 to 0.1 mole per mole host crystal.

B 388,521
METHOD FOR PRODUCING HALOPHENOXY 2-NITROBENZOATE ESTERS

Clifford E. Hunt, Somerset, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 287,950, Sept. 11, 1972, abandoned. This application Aug. 15, 1973, Ser. No. 388,521
Int. Cl.² C07C *101/54*
U.S. Cl. 260—471 R **16 Claims**

References Cited
UNITED STATES PATENTS

3,703,546	11/1972	Leaper et al.	260/471 R
3,784,635	1/1974	Theissen	260/471 R

1. A method for producing an alkylhalophenoxynitrobenzoate which comprises nitrating an alkylhalobenzoate in the presence of sulfuric acid and substantially stoichiometric amounts of nitric acid at a temperature of from about −20° to about +30°C. to obtain an alkylhalonitrobenzoate in improved yield and reacting same with an alkali metal phenate in the presence of from about 4 to about 16 moles of dimethylformamide to about one mole of alkylhalonitrobenzoate at from about 50° to about 150°C. to produce said alkylhalophenoxynitrobenzoate.

B 390,031
2-FLUORO-6-TRIFLUOROMETHYLBENZOIC ACID

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 107,455, Jan. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 95,405, Dec. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 12,864, Feb. 19, 1970, abandoned, Continuation-in-art of Ser. No. 884,011, Dec. 10, 1969, abandoned. This application Aug. 20, 1973, Ser. No. 390,031
Int. Cl.² C07C *63/12*
U.S. Cl. 260—515 A **1 Claim**

References Cited
UNITED STATES PATENTS

3,592,842	7/1971	Houlihan	260/515
3,624,087	11/1971	Beck	260/515

FOREIGN PATENTS OR APPLICATIONS

817,173	7/1959	United Kingdom	260/515
1,112,509	8/1961	Germany	260/515

OTHER PUBLICATIONS
Houlihan I, Chem. Abstracts, Vol. 72 (1970), p. 401.
Houlihan II, Chem. Abstracts, Vol. 75 (1971), p. 422.

1. The compound which is 2-fluoro-6-trifluoromethyl benzoic acid.

B 417,014
PRIMER COMPOSITIONS

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 216,769, Jan. 10, 1972, Pat. No. 3,808,018. This application Nov. 19, 1973, Ser. No. 417,014
Int. Cl.² C08F *212/08*
U.S. Cl. 260—88.2 C **8 Claims**

References Cited
UNITED STATES PATENTS

2,952,576	9/1960	Wheelock	260/827
3,232,895	2/1966	Klein	260/28.5 AV
3,285,802	11/1966	Smith et al.	161/185
3,644,141	2/1972	Preston	260/827
3,644,245	2/1972	Flanagan	260/824 R
3,808,018	4/1974	Plueddeman	106/237

1. A composition consisting essentially of

a. 80 to 99.99 weight percent of a tackifier component consisting essentially of a resin having a molecular weight of no more than 12,000, said resin being selected from the group consisting of polyterpenes, coumarone-indene resins and modified coumarone-indene resins, polycyclopentadiene, aliphatic hydrocarbon resins and chlorinated aliphatic hydrocarbon resins having a ring and ball softening temperature of from 50° to 120°C., said aliphatic resins being derived from olefinic monomers having 3 to 5 inclusive carbon atoms; polystyrene and copolymers of styrene with at least one ethylenically unsaturated aromatic monomer, phenolic and modified phenolic resins and chlorinated terphenyl or diphenyl resins having a chlorine content of about 42 to 65 weight percent; and

b. 0.01 to 20 weight percent of an organosilicon compound of the general formula

water-soluble partial condensates thereof and hydrochloride salts thereof in which

X is the hydroxyl group or a hydrolyzable radical;

Q is a divalent hydrocarbon radical or a substituted divalent hydrocarbon radical containing nitrogen in the form of

groups wherein R is a hydrogen atom, a lower alkyl group containing from 1 to 6 inclusive carbon atoms or a phenyl radical; and

R′ is selected from the group consisting of the hydrogen atom, monovalent hydrocarbon radicals containing from 1 to 18 inclusive carbon atoms and substituted monovalent hydrocarbon radicals containing oxygen in the form of —COC or

and having from 1 to 18 inclusive carbon atoms.

B 418,489
WATER-SOLUBLE POLYMERS AND UTILIZATION THEREOF

Richard Irwin Leavitt, Lower Makefield Township, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 23, 1973, Ser. No. 418,489
Int. Cl.² C12D *13/06*
U.S. Cl. 195—29 **11 Claims**

References Cited
UNITED STATES PATENTS

3,761,353	9/1973	Noe	195/29

1. A process for manufacturing watersoluble polymers that thicken reversibly in aqueous solution on adjustment of the degree of alkalinity, which comprises contacting, under conversion conditions, an aqueous suspension of a water-dispersible protein with the extracellular enzymes formed by the microorganism *Pseudomonas fabricans* No. 492 (A.T.C.C. No.21984), said enzymes being in an amount effective to produce said reversible thickening.

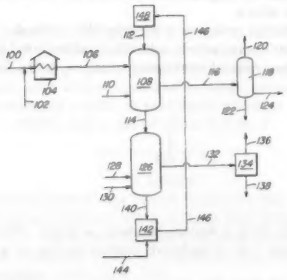
B 438,916
COMBINATION PROCESS FOR RESIDUA DEMETALATION, DESULFURIZATION AND RESULTING COKE GASIFICATION

Michael P. Rosynek, Bryan, Tex.; George F. Shipman, and Tsoung-Yuan Yan, both of Trenton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 1, 1974, Ser. No. 438,916
Int. Cl.² C10J *3/00*; C10G *9/30*; C10B *55/00*; B01D *15/06*
U.S. Cl. 208—253 **13 Claims**

References Cited
UNITED STATES PATENTS

3,691,063	9/1972	Kirk	208/91
3,726,791	4/1973	Kimberlin et al.	208/127
3,813,331	5/1974	Weisz et al.	208/251
3,825,486	7/1974	Miale	208/110



1. A process for residual oil demetalation and desulfurization and resulting coke gasification which comprises contacting said residual oil with a porous refractory oxide in the absence of added hydrogen, at a temperature of from greater than 700°F to about 1100°F and a porous refractory oxide to oil weight ratio of from about 0.1 to about 5, recovering from said residual oil contacting step upgraded residual oil of cracking feed quality and coke-deposited refractory oxide, contacting said coke-deposited refractory oxide with steam and a free oxygen containing gas at a temperature of from about 1000°F to about 1500°F and a mole ratio of steam to oxygen of from about 3 to about 5, and recovering from said coke-deposited refractory oxide contacting step producer gas and regenerated coke-free refractory oxide.

B 450,967
SYNTHETIC AMORPHOUS SILICAS OF PREDETERMINED PORE DISTRIBUTION METHOD OF PRODUCING SAME

Thomas O. Mitchell, West Trenton, and Darrell Duayne Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 14, 1974, Ser. No. 450,967
Int. Cl.² B01J *29/00*, *29/06*; C01B *33/12*
U.S. Cl. 252—454 **21 Claims**

References Cited
UNITED STATES PATENTS

2,715,060	8/1955	Barry	423/336
3,210,273	10/1965	Taulli et al.	423/335 X
3,236,594	2/1966	Ray	423/336
3,709,833	1/1973	Thomas	252/454 X

1. A synthetic amorphous solid having shape selective properties prepared by the steps of (1) hydrolyzing and (2) polymerizing at up to 200°C. in water a silane having the formula $R[Si]X_3$ wherein X is a hydrolyzable group R is a nonhydrolyzable group and [Si] is selected from the group consisting of $-Si\leqslant$ and $-Si(R)_2-O-Si\leqslant$ and (3) calcining the polymerized product wherein there is also present in the final calcined product in addition to silicon at least one member selected from the group consisting of groups IIIA, IVA, IVB, VA, VB, VIB VIIB and VIII of the Periodic Table the source of said member being present in the initial hydrolyzing step.

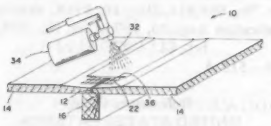
B 456,148
ACCELERATED DRYWALL JOINT TREATMENT

Joseph W. Schneller, Williamsville, and Richard E. Smith, Tonawanda, both of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,148
Int. Cl.² E04B *2/72*, *2/00*
U.S. Cl. 156—71 **1 Claim**

References Cited
UNITED STATES PATENTS

3,035,940	5/1962	Hobson	117/169 R
3,116,195	12/1963	Lathrop et al.	156/71
3,284,227	11/1966	Gerton	117/70 D
3,383,271	5/1968	Roberts et al.	117/70 R
3,576,091	4/1971	Shull et al.	156/71



1. The method of treating joints in drywall construction comprising the steps of saturating a narrow reinforcing tape with a set accelerator for settable gypsum, adhering said narrow reinforcing tape over a joint between a pair of wallboards, coating a narrow area of the face of said pair of wallboards along each side of said joint between the said wallboards with a set accelerator for settable gypsum with said coating cover-

ing said tape, applying a thin layer of a joint compound having a settable gypsum binder over the area of said coating of set accelerator, and applying a second coating of said set accelerator over the top of said thin layer of joint compound, whereby said thin layer of joint compound hardens rapidly and subsequently steps in the erection of a finished wall therefrom may proceed substantially sooner thereafter.

B 457,886

LOW TEMPERATURE FIRED ELECTRICAL COMPONENTS AND METHOD OF MAKING SAME

Galeb H. Maher, Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of Ser. No. 206,402, Dec. 9, 1971, Pat. No. 3,811,937. This application Apr. 4, 1974, Ser. No. 457,886

The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.

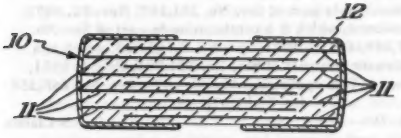
Int. Cl.² B05D *5/12*

U.S. Cl. 428—434 **10 Claims**

References Cited

UNITED STATES PATENTS

2,889,952	6/1959	Claypoole	106/53
3,331,777	7/1967	Hoffman	106/53
3,365,631	1/1968	Delaney et al.	317/258
3,400,001	9/1968	Hasumi et al.	317/258
3,495,996	2/1970	Delaney et al.	317/258
3,600,652	8/1971	Riley	317/258
3,638,084	1/1972	Burn	317/258
3,653,933	4/1972	Tsunekawa	106/54
3,682,840	8/1972	Van Loan	106/53
3,784,887	1/1974	Sheard	317/258
3,799,754	3/1974	Thomas	106/54
3,811,937	5/1974	Maher	117/217



1. An electrical component comprising a low temperature fired ceramic body of a fired blend containing 70 to 92% by weight of a calcined high temperature ceramic mixture and 8–30% by weight of a low firing temperature glass formulation having a melting temperature less than 1,600°F, said calcined ceramic mixture containing from 0–30 mole percent baria, 45–95 mole percent titania and 5–50 mole percent of a rare earth oxide selected from the group consisting of neodymium, lanthanum and mixtures thereof, said glass formulation consisting in weight percent essentially of 5–30% of the glass former oxides selected from the group consisting of B_2O_3 and SiO_2, 0–5% Al_2O_3, 0–15% ZnO, 0–20% CdO, and at least 35% of an oxide selected from the group consisting of Bi_2O_3 and PbO; and at least one metallic film located within said ceramic body, said metallic film having a melting point not substantially greater than the firing temperature of said body.

B 458,060

PROCESS FOR THE CONTINUOUS DYEING OF THREADS AND SLIVERS OF DRY SPUN ACRYLONITRILE POLYMERS

Ulrich Reinehr; Alfred Nogaj, both of Dormagen, and Günther Hölzing, Dormagen-Delhofen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 4, 1974, Ser. No. 458,060

Claims priority, application Germany, Apr. 5, 1973, 2317132

Int. Cl.² D06P *5/00, 3/70;* **D01F** *6/18*

U.S. Cl. 8—17 **11 Claims**

References Cited

UNITED STATES PATENTS

2,615,198	10/1952	Flannagan	264/206
3,018,157	1/1962	Kovarik et al.	8/177 R
3,111,357	11/1963	Wirth et al.	264/78
3,113,827	12/1963	Moore	264/78
3,242,243	3/1966	Knudsen	264/78
3,296,341	1/1967	Briar et al.	264/78
3,310,456	3/1967	Fujita et al.	264/78
3,402,014	9/1968	Ucci	264/78
3,543,409	12/1970	Fuhs et al.	8/177 R
3,545,914	12/1970	Hayashi et al.	8/177 R
3,787,182	1/1974	Eigenmann et al.	8/177 R

1. A process for the continuous and rapid dyeing of dry-spun acrylonitrile copolymer comprising at least 150 milliequivalents of acidic groups per kg of acrylonitrile copolymer, said process comprising passing the dry-spun copolymer through a bath of water at room temperature, and through squeezing rollers and thereafter removing up to 70% but at least 30% of the moisture content from the copolymer by pressing and then heating and drying the copolymer to a residual moisture content of from 3 to 10%, dyeing in a dye-bath at temperatures of from room temperature to 100°C with a dyeing time of from fractions of a second to 60 seconds, then fixing, stretching at a ratio of from 1:2.5 to 1:6.5, washing, brightening, drying and crimping.

B 460,441

FLEXIBLE CELLULAR POLYURETHANE FOAM COMPOSITIONS HAVING INCREASED FLAME RETARDANCE

John G. Demou, Lincoln Park; Louis C. Pizzini, Trenton, and John T. Patton, Jr., Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 264,157, June 19, 1972, Pat. No. 3,804,782. This application Apr. 12, 1974, Ser. No. 460,441

Int. Cl.² C08G *18/14, 18/18, 18/20*

U.S. Cl. 260—2.5 AC **8 Claims**

References Cited

UNITED STATES PATENTS

2,939,851	6/1960	Orchin	260/2.5 AC
3,030,951	4/1962	Mandarino	260/2.5 AC
3,226,345	12/1965	Saunders	260/2.5 AC
3,471,416	10/1969	Fijal	260/2.5 AP
3,728,291	4/1973	Carroll et al.	260/2.5 AC
3,736,272	5/1973	Mosso et al.	260/2.5 AP
3,741,917	6/1973	Morenouse	260/2.5 BG
3,803,064	4/1974	Fishbein	260/2.5 AM

FOREIGN PATENTS OR APPLICATIONS

908,337	10/1967	United Kingdom	260/2.5 DW
1,162,517	8/1969	United Kingdom	260/2.5 BG

OTHER PUBLICATIONS

Patten, "Highly Resilient, Cold Molded Urethane Flexible Foam," Journal of Cellular Plastics, May/June, 1972, pp. 134–143.

1. A flexible polyurethane foam prepared in the presence of water by the reaction of:

a. a polyalkylene polyether polyol having an average equiv-

alent weight of from 200 to 2500 with

b. an organic polyisocyanate employing an isocyanate index of from 130 to 225 in the presence of from 0.05 part to 10 parts by weight per 100 parts of weight of said polyalkylene polyether polyol of an isocyanate trimerization catalyst selected from the group consisting of triethylene diamine, alkylene oxide-water adducts of triethylene diamine, triethylene diamine diformate, and N-benzyltrialkyl ammonium alkoxides and hydroxides.

B 461,352
DEPILATORY FORMULATION

Mario J. de la Guardia, Savannah, Ga., assignor to Carson Chemical Company, Savannah, Ga.

Filed Apr. 16, 1974, Ser. No. 461,352
Int. Cl.[2] A61K 7/155
U.S. Cl. 8—161 **13 Claims**

References Cited
UNITED STATES PATENTS

3,271,258	9/1966	Zviak et al.	8/94.16
3,384,548	5/1968	Zviak et al.	8/160

FOREIGN PATENTS OR APPLICATIONS

1,956,002	5/1970	Germany

OTHER PUBLICATIONS

Chemical Abstracts, Vol. 72: 124997m, (1970).

1. A stable aqueous depilatory composition having a pH of about 11.5 to about 12.7 comprising, as the essential active ingredients,

a. one part of at least one alkali metal silicate, wherein the amount of said alkali metal silicate is about 0.1 to 1.0 weight percent, based on the total weight of said composition,

b. 5 to 200 parts of at least one alkaline earth metal acid salt, wherein the acid is selected from the group consisting of thioglycolic acid and thiolactic acid, and

c. 1 to 50 parts of thiourea, wherein the composition has a shelf stability under ambient conditions of at least three months.

B 462,386
DIMENSIONALLY STABLE, FLEXIBLE HYDRAULIC HOSE HAVING IMPROVED CHEMICAL AND TEMPERATURE RESISTANCE

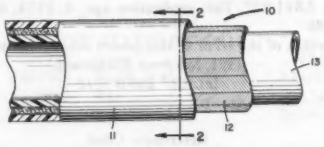
Hans A. Johansen, Mantua, and David D. Russell, Atwater, both of Ohio, assignors to Samuel Moore & Company, Aurora, Ohio

Division of Ser. No. 328,367, Jan. 3, 1973, Pat. No. 3,881,521. This application Apr. 19, 1974, Ser. No. 462,386
Int. Cl.[2] B29D 23/12, 23/04
U.S. Cl. 156—143 **16 Claims**

References Cited
UNITED STATES PATENTS

2,076,729	4/1937	Kennedy	138/126
3,116,760	1/1964	Matthews	138/125
3,159,183	12/1964	Brumbach	138/125
3,221,774	12/1965	Fritz et al.	138/125
3,253,618	5/1966	Cook	159/149
3,253,619	5/1966	Cook et al.	156/149
3,334,165	8/1967	Koch	156/149
3,750,712	8/1973	Brand	138/124
3,790,419	2/1974	Atwell et al.	156/149

1. In a method for making a flexible, dimensionally stable hydraulic hose which comprises extruding a self-supporting elastomeric core tube, surrounding the core tube with reinforcing fibers and extruding an elastomeric sheath over the fibers, the improvement which comprises tautly winding biased overlapping reinforcing fibers uniformly over the surface of the core tube to provide a reinforcing layer which covers at least about 85% thereof, with the fibers wound about the core



tube in each direction forming an angle of from about 50° to about 65° with the longitudinal axis of the core tube whereby substantial expansion of the core tube under pressure at elevated temperatures is prevented, and irradiating the core tube with ionizing electrons until it is no longer thermoplastic and has improved solvent, chemical and heat resistance.

B 468,350
DI-OLEFINIC KETONES

Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 201,167, Nov. 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 187,898, Oct. 8, 1971, Pat. No. 3,752,843, which is a continuation-in-part of Ser. No. 111,701, Feb. 1, 1971, abandoned. This application May 9, 1974, Ser. No. 468,350
Int. Cl.[2] C07C 49/20
U.S. Cl. 260—593 R **3 Claims**

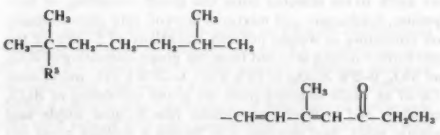
References Cited
UNITED STATES PATENTS

3,712,922	1/1973	Henrick et al.	260/593 R
3,729,486	4/1973	Siddall	260/DIG. 44
3,816,484	6/1974	Henrick	260/593 R

OTHER PUBLICATIONS

Slama et al., Proceeding of the National Academy of Science, Vol. 54, pp. 411–414, (1965).
Sarmiento et al., Science, Vol. 179, pp. 1342–1343.

1. A compound of the formula:



in which R^5 is hydrogen or methyl.

B 470,348

METHOD OF SEPARATING METHYLOLPHENOLS FROM SOLUTIONS

Robert Elliott Davis, Oklahoma City, Okla., and Friedrich Josef Weck, Hacienda Heights, Calif., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. Nos. 716,337, March 27, 1968, abandoned, and Ser. No. 321,046, Jan. 4, 1973, abandoned. This application May 16, 1974, Ser. No. 470,348

Int. Cl.[2] C07C *39/06, 39/27*

U.S. Cl. 260—621 K 9 Claims

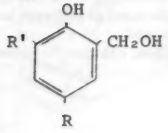
References Cited

UNITED STATES PATENTS

2,260,337	10/1941	Prescott et al.	260/624 A
2,260,338	10/1941	Prescott et al.	260/624 A
2,587,753	4/1952	O'Conner	260/621 A
2,899,470	8/1959	Goldstein et al.	260/624 A
3,479,294	11/1967	Week	252/182

1. A method of separating methylolphenol from a phenolic impurity which comprises:

contacting (A) an organic solution containing (1) an organic solvent; (2) at least one phenolic impurity and (3) about 1% to about 20% by weight of the methylolphenol having the formula

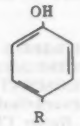


in which R is selected from the group consisting of hydrogen, phenyl, bromine, chlorine and alkyl radicals having from 3 to 8 carbon atoms and R' is selected from the group consisting of hydrogen, phenyl, chloro, CH_3OH and alkyl radicals having from 1 to 9 carbon atoms

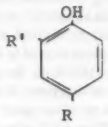
with (B) an aqueous alkaline borate solution containing lithium ions and being free of substantial amounts of other alkali metal ions, for a period of time sufficient for a solid complex of lithium and boron to form with said methylolphenol, the organic solution being contacted with said aqueous alkaline borate solution for at least about 0.5 hour at a temperature of between about 20° and about 40°C. and thereafter contacting said solid complex with a dilute inorganic acid and an organic solvent for said methylolphenol to dissolve said complex and provide an aqueous phase containing the lithium and boron values of said complex and an organic phase containing the methylolphenol portion of said complex and separating said phases, the concentration of lithium and boron ions in the alkaline borate solution being sufficient to provide at least about one lithium ion and one boron ion for every two moles of said methylolphenol in said organic solution;

said organic solvent being selected from the group consisting of benzene, toluene, xylenes, alkyl benzene, hexane, heptane, octane, nonane, kerosene, mineral spirits, petroleum ether, butyl ether, isopropyl ether, hexyl ethers, chloroform, carbon tetrachloride, chlorobenzene, monohydric alcohols having from 8 to 17 carbon atoms per molecule and mixtures thereof and said phenolic impurity being at least one member of the group consisting of

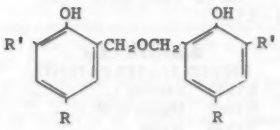
a. unreacted starting materials having the formula



b. partially reacted starting materials having the formula

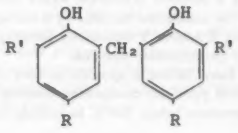


c. degradation products of the methylolphenol having the formula



and

d. degradation products of the methylolphenol having the formula



in which R and R′ in each instance are as hereinbefore defined for the methylolphenol.

B 471,221
METHOD FOR PRODUCING AN ALKALI METAL PYROPHOSPHATE

Peter Coad, Midwest City; Edward Conley Murray, Oklahoma City, both of Okla., and Homer Charles Reed, Newport Beach, Calif., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed May 20, 1974, Ser. No. 471,221
Int. Cl.² C01B *15/16, 25/26*
U.S. Cl. 423—315 **12 Claims**

References Cited
UNITED STATES PATENTS

3,473,889	10/1969	Shen	423/315

1. A method for producing an alkali metal pyrophosphate comprising: admixing an alkali metal nitrate with aqueous phosphoric acid, heating said admixture to a temperature of at least about 700°C in the presence of a catalytic amount of at least one metal oxide selected from the group consisting of oxides of iron, vanadium, manganese and chromium for a period of time sufficient to produce said alkali metal pyrophosphate and gaseous reaction products and recovering said alkali metal pyrophosphate.

B 471,579
SORBENT FOAM MATERIAL

Alan N. Ferguson, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 20, 1974, Ser. No. 471,579
Claims priority, application United Kingdom, May 25, 1973, 25182/73
Int. Cl.² C08G *69/46, 73/06*
U.S. Cl. 260—2.5 R **14 Claims**

References Cited
UNITED STATES PATENTS

2,950,295	8/1960	Zimmer	260/397.7
3,306,862	2/1967	Mageli et al.	260/2.5
3,493,522	2/1970	Webb	260/2

1. A black sorbent thermoset foam which has been prepared by the pyrolysis of a composition, liquid at the pyrolysis temperature, comprising at least one Lewis acid metallic salt and at least one aromatic nitrogen-containing compound having the general formula:

$$X-Ar-Y$$

in which Ar represents an aromatic nucleus on which X and Y are substituents directly attached to the nucleus, X represents a substituent having a negative Hammett sigma constant and attached to the aromatic nucleus by a nitrogen, oxygen or sulphur atom, and Y represents a substituent having a positive Hammett sigma constant and attached to the aromatice nucleus by a nitrogen atoms, the substituents X and/or Y optionally forming part of a ring fused onto the aromatic nucleus,

the thermoset foam having a specific surface area of at least 50 m^2/g, and said pyrolysis comprising heating said composition to a temperature below 300°C to initiate reaction of said composition.

B 472,256
CARBAMIC ACID ESTERS

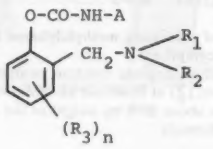
Jürgen Hocker, Schildgen; Hans-Joachim Diehr, Wuppertal, and Rudolf Merten, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 22, 1974, Ser. No. 472,256
Claims priority, application Germany, May 22, 1973, 2325927
Int. Cl.² C07C *125/06*
U.S. Cl. 260—472 **2 Claims**

References Cited
UNITED STATES PATENTS

3,803,062	4/1974	Rodia et al.	260/472

1. A compound of the general formula



wherein

n represents an integer of from 1 to 4,

A represents an aromatic hydrocarbon group obtained by removing the NCO group from a monomeric aromatic monoisocyanate containing 6–14 carbon atoms,

R_1 and R_2 may be the same or different and each represent a C_1-C_6 alkyl group, and

R_3 represents hydrogen, chlorine, bromine, or a C_1-C_{18} alkyl group.

B 477,252
PROCESS FOR PREPARING 2-AMINO-5-CHLOROPYRIDINE

Thomas J. Kress, 215 E. Brunswick Ave., Indianapolis, Ind. 46227, and Larry L. Moore, Rte. 1, Box 209, Bargersville, Ind. 46106

Filed June 7, 1974, Ser. No. 477,252
Int. Cl.² C07D *213/02*
U.S. Cl. 260—296 R **5 Claims**

References Cited
UNITED STATES PATENTS

3,579,528	5/1971	Haszeldine et al.	260/296 X
3,849,429	11/1974	Boudakian	260/296 R

OTHER PUBLICATIONS

Friedrich et al., Pharmazie, Vol. 19, pp. 677 to 678, (1964).
Van Zweiten et al., Rec. Trav. Chim., Vol. 80, pp. 1066 to 1074, (1961).
Klingsberg, Pyridine and its Derivatives, Part Two, frontis page and p. 308, (1961).
English et al., J. Am. Chem. Soc., Vol. 68, pp. 453 to 458, (1946).

1. A process for preparing 2-amino-5-chloropyridine which comprises reacting 2-aminopyridine with no more than two equivalents of a chlorinating agent selected from the group consisting of chlorine gas, hypochlorous acid, thionyl chloride, and sulfuryl chloride in a strongly acidic medium having a Hammett acidity function less than −3.5.

B 481,737
PAPER HONEYCOMB CUSHIONING PAD

William R. Briggs, Bowie, Md., and Eugene A. Ripperger, Austin, Tex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

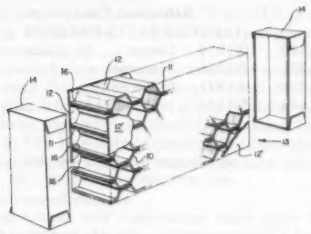
Filed June 21, 1974, Ser. No. 481,737
Int. Cl.[2] B32B *3/12*
U.S. Cl. 428—73 3 Claims

References Cited
UNITED STATES PATENTS

2,428,979	10/1947	May	156/197
2,477,852	8/1949	Bacon	161/68
2,768,924	10/1956	Wright	161/43
2,889,297	6/1959	Brandner et al.	156/332 X
2,937,956	5/1960	Fendius et al.	117/76
3,035,961	5/1962	Jones et al.	156/197
3,247,039	4/1966	Schultheiss	156/167
3,587,479	6/1971	Geschwender	108/51
3,756,894	9/1973	Shugart	156/443

FOREIGN PATENTS OR APPLICATIONS

129,793	11/1948	Australia	161/68



1. In a double faced expanded paper honeycomb cushioning pad adapted for preventing blowouts through the ends of said double faced expanded paper honeycomb cushioning pad upon impact, said double faced expanded paper honeycomb cushioning pad comprising a plurality of sheets of Kraft paper adhered together along parallel spaced apart glue lines, expanded to form air cells hexagonally shaped in cross section and bounded by portions of said sheets of Kraft paper, and double faced by facing sheets of Kraft paper adhered over the top and bottom of the expanded paper honeycomb cushioning pad, thereby forming in said double faced expanded paper honeycomb cushioning pad a plurality of adjacent closed air cells hexagonally shaped in cross section, said double faced expanded paper honeycomb cushioning pad having a pair of ends each comprising a row of vertically sliced air cells, the glue lines of said vertically sliced air cells being normal to said ends, the improvement which comprises means for preventing blowouts through said ends of said double faced expanded paper honeycomb cushioning pad, said blowout preventing means comprising two end caps, each of said two end caps being adhered to the exterior surfaces of said double faced expanded paper honeycomb cushioning pad adjacent to one of said two ends so as to close and seal each of said two ends, said end caps being constructed of 70 to 80 lb. Kraft paper tape, said Kraft paper tape being folded over said facing sheets and over the side surfaces of said double faced expanded paper honeycomb cushioning pad to a sufficient extent and adhered sufficiently tightly to said facing sheets and said side surfaces to prevent a blowout from occurring through either of said two ends of said double faced expanded paper honeycomb cushioning pad upon impact.

B 483,865
POLYVINYL CHLORIDE POLYBLEND MOLDING COMPOSITION

Thor J. G. Lonning, Suffield, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed June 27, 1974, Ser. No. 483,865
Int. Cl.[2] C08F *19/08*
U.S. Cl. 260—23 XA 20 Claims

References Cited
UNITED STATES PATENTS

2,802,808	8/1937	Hayes	260/876 R
3,636,138	1/1972	Beer	260/29.7 UP

1. A polymer composition comprising:

A. from about 50 to 80 parts by weight of a polyvinyl chloride polymer being characterized by having an inherent viscosity of from about 0.7 to 1.5 in a 0.2 weight percent cyclohexanone solution at about 25° to 30°C., said polyvinyl chloride polymer comprising a polymer selected from the group consisting of homopolyvinyl chloride and polyvinyl chloride copolymers having up to 25 weight percent of another ethylenically unsaturated comonomer polymerizable therewith,

B. a butadiene-styrene rubbery substrate having a butadiene content of 68 to 95 percent by weight and a styrene content of 5 to 32 percent by weight based on the total weight of the butadiene-styrene rubbery substrate which rubbery substrate is further characterized as having a particle size in the range of from 0.06 to 0.2 micron, a gel content in the range of from 40 to 95 percent, a swelling index in the range of from 10 to 40, and a second order transition temperature (Tg) less than −40°C.,

C. A superstrate grafted onto the rubber substrate which superstrate comprises:

1. the polymerization product of a first polymerizable monomer composition comprising:
   a. from 0.1 to 2 percent by weight of a nonconjugated diolefin monomer,
   b. from 20 to 30 percent by weight of an ethylenically unsaturated nitrile selected from the group consisting of acrylonitrile, and mixtures of acrylonitrile and methacrylonitrile which contain up to 20 percent by weight of methacrylonitrile,
   c. from 40 to 60 percent by weight of a vinylidene aromatic hydrocarbon monomer selected from the group consisting of styrene and alpha methyl styrene,
   d. from 20 to 50 percent by weight of methyl methacrylate, and
2. the polymerization product of a second polymerizable monomer composition comprising from 55 to 85 percent by weight of an ethylenically unsaturated nitrile monomer selected from the group consisting of acrylonitrile and mixtures of acrylonitrile and methacrylonitrile which contains up to 20 percent by weight of methacrylonitrile based on the total weight of acrylonitrile and methacrylonitrile and from 15 to 45 percent by weight of a monovinylidene aromatic hydrocarbon monomer wherein the percent by weight is based on the total weight of the monomers in the second polymerizable monomer mixture;

wherein the grafted superstrate contains a total of at least 40 percent by weight ethylenically unsaturated nitrile monomer and wherein the ratio of grafted superstrate to substrate is in the range of from 15–200:100 wherein (B) plus (C) are present in from about 20 to 50 parts by weight, the total parts by weight of (A), (B) and (C) being 100 parts,

D. a plasticizer system for said polymer composition, said plasticizer system being present in a sufficient amount to produce in said polymer composition after such is heat fused at a temperature of from about 120° to 215°C., a Shore A hardness value in the range of from about 45 to 95 at about 23°C.,

E. a stabilizer system for said polymeric composition, said stabilizer system being present in such amounts as to substantially prevent the thermal degradation of said polymeric composition during heat fusion for 5 to 15 minutes at temperatures in the range of from about 120° to 215°C., and

F. a lubricant system present in such amounts as to permit the release of said polymeric composition from a heated solid surface after said polymeric composition has been heat fused at temperatures in the range of from about 120° to 215°C.

B 488,111

PHENYL- AND (SUBSTITUTED)-PHENYL-1,2,3-TRIAZOLE-ALKANOIC AND -ALKENOIC ACIDS

Robert Thomas Buckler, Edwardsburg, Mich.; Harold Eugene Hartzler, Elkhart, Ind., and Shin Hayao, Tokyo, Japan, assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 364,609, May 29, 1973, Pat. No. 3,900,942. This application July 12, 1974, Ser. No. 488,111

Int. Cl.² C07D 249/06

U.S. Cl. 260—308 A **3 Claims**

References Cited

OTHER PUBLICATIONS

Tanaka et al., J. Organic Chemistry, Vol. 38, pp. 2708–2712 (1973).

1. 3-[4-(m-Bromo)-phenyl-1,2,3,(1H)-triazole-1]-propionic acid.

B 496,431

METHOD OF CONTROLLING RICE BLAST WITH N-(ALKYLTHIOPHENYL)MALEIMIDES

Donald E. Bublitz, 1592 Hoytt Drive, Concord, Calif. 94521

Division of Ser. No. 307,608, Nov. 17, 1972, Pat. No. 3,853,912. This application Aug. 9, 1974, Ser. No. 496,431

Int. Cl.² A01N 9/22

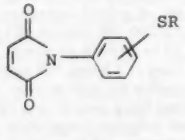
U.S. Cl. 424—274 **11 Claims**

References Cited

UNITED STATES PATENTS

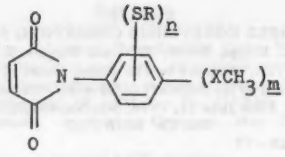
2,205,558	6/1940	Flett	424/274 X
3,129,225	4/1964	Shapiro et al.	424/274 X

1. A composition comprising an inert agriculturally acceptable carrier and a rice-blast controlling amount of a compound of the formula:



wherein SR is in the ortho- or meta- position and R is methyl.

4. A method for controlling rice blast on a rice plant comprising applying to the plant to be protected a rice blast controlling amount of a compound having the formula:



wherein —(SR)$_n$ is in the ortho or meta position; n is 0 or 1; m is 0 or 1, with the proviso that the sum of $n + m$ is always 1; R is an alkyl group of from 1 to 6 carbon atoms; and X is oxygen or sulfur.

B 501,317

DEMETALATION AND DESULFURIZATION OF OIL IN SEPARATE CATALYTIC ZONES

Donald Milstein, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 393,092, Aug. 30, 1973, abandoned. This application Aug. 28, 1974, Ser. No. 501,317

Int. Cl.² C10G 23/00

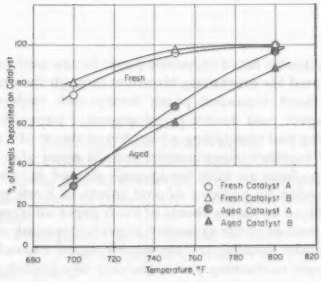
U.S. Cl. 208—210 **7 Claims**

References Cited

UNITED STATES PATENTS

2,174,510	10/1939	Gwynn	208/210
3,291,721	12/1966	Schuman	208/210
3,607,725	9/1971	Irvine et al.	208/251 H
3,809,644	5/1974	Johnson et al.	208/210

EFFECT OF TEMPERATURE ON CATALYST METALS POISONING
KUWAIT ATM. RESID 2000 PSIG, 0.75 LHSV, 5000 SCF H_2 / BBL



1. In a process for hydrodesulfurizing a petroleum oil that contains residual hydrocarbon components including metals, wherein said oil and hydrogen are passed serially through two separate catalytic zones at a space velocity of about 0.1 to 5.0 L.H.S.V., a pressure of about 500 to 3,000 p.s.i.g., and with a hydrogen circulation rate of about 1,000 to 15,000 s.c.f./bbl., and at a temperature progressively increased in both catalytic zones from a start-of-run temperature of about 650°F to an end-of-run temperature of about 800°F at which temperature the active hydrodesulfurization catalyst in the second catalytic zone becomes spent, the improvement comprising taking advantage of said spent catalyst's demetalation activity by

passing said oil that contains residual hydrocarbon components, and hydrogen, at a start-of-run temperature of at least about 770°F, through said first catalytic zone containing catalyst consisting essentially of said spent catalyst from said second reaction zone, thereby forming demetallized oil; and passing said demetallized oil and hydrogen,

at a start-of-run temperature of about 650°F through said second reaction zone containing active hydrodesulfurization catalyst comprisisng a Group VIB and a Group VIII metal on alumina.

B 501,415

BACKSIZING CARPET WITH HOT MELT COMPOSITION OF ETHYLENE COPOLYMER, ATACTIC POLYPROPYLENE AND VULCANIZED RUBBER

David D. Taft, Columbus, Ohio, and Terry H. Shepler, St. Paul, Minn., assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 216,242, Jan. 7, 1972, Pat. No. 3,849,353. This application Aug. 28, 1974, Ser. No. 501,415

Int. Cl.² B05D *5/10*

U.S. Cl. 427—207 **15 Claims**

References Cited

UNITED STATES PATENTS

3,577,372	5/1971	Flanagan et al.	117/122 H
3,619,270	11/1971	Tesch	117/122 H
3,753,769	8/1973	Steiner	117/122 H
3,849,353	11/1974	Taft et al.	161/247 X

1. A process for backsizing a tufted carpet having a primary textile backing and non-woven tufts of synthetic fibers protruding therefrom which comprises:

a. heating to a temperature of about 160°F to 375°F, a hot melt coating composition, said hot melt composition consisting essentially of:

1. copolymer of ethylene and unsaturated ester monomer selected from the group consisting of vinyl acetate; alkyl acrylate wherein the alkyl group contains 1-18 carbon atoms; and mixtures thereof; containing from about 40 to 85% by weight of ethylene and from about 15 to about 60% by weight of unsaturated ester monomer;
2. atactic polypropylene; and
3. vulcanized rubber; said composition based upon the combined weight of (1), (2), and (3) containing from about 5% to about 50% by weight of (1); about 10 to about 85% by weight of (2) and about 10 to about 50% of (3);

b. applying a uniform coating in an amount from about 10 to 40 ounces per square yard of said composition in a molten state to the backside of said carpet at a coating station while moving said carpet past said station at a speed of from about 20 to 60 feet per minute; and

c. thereafter solidifying said carpet by cooling it below its melting point.

B 501,540

ASPHALTIC COMPOSITIONS CONTAINING SYNTHETIC TERPENIC RESIN AND AN INTERPOLYMER OF ETHYLENE, VINYL ACETATE AND AN ORGANIC ACID

Richard J. Petrucco, Laurel Springs, and Charles A. Pagen, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 29, 1974, Ser. No. 501,540

Int. Cl.² C08L *91/00*

U.S. Cl. 260—28.5 AS **8 Claims**

References Cited

UNITED STATES PATENTS

3,215,657	11/1965	Beresniewicz et al.	260/78.5 HC
3,414,533	12/1968	Trieschmann et al.	260/28.5 AS
3,442,841	5/1969	Adelman	260/28.5 AS
3,629,164	12/1971	Smith et al.	260/28.5 AS
3,645,947	2/1972	Quigg et al.	260/28.5 AS
3,821,144	6/1974	Goyer et al.	260/28.5 AS

1. An asphaltic composition comprising a major amount of asphalt, a minor amount of a synthetic terpenic resin, and a minor amount of an interpolymer of ethylene, vinyl acetate, and an organic acid selected from the group consisting of acrylic, methacrylic, itaconic, maleic and fumaric acids; the alkyl hydrogen maleates and the alkyl hydrogen fumarates.

B 502,773

ALUMINA-CHROMIA-METAL (IV) OXIDE REFRACTORY FIBERS HAVING A MICROCRYSTALLINE PHASE

Harold G. Sowman, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 376,628, July 5, 1973, abandoned. This application Sept. 3, 1974, Ser. No. 502,773

Int. Cl.² C04B *35/10, 35/12, 35/18*

U.S. Cl. 106—57 **14 Claims**

References Cited

UNITED STATES PATENTS

3,311,481	3/1967	Sterry et al.	106/65
3,311,689	3/1967	Kelsey	106/73.33
3,503,765	3/1970	Blaze	106/69
3,585,153	6/1971	Kiehl et al.	106/66
3,632,709	1/1972	Hayes et al.	106/65
3,652,749	3/1972	Sobel et al.	106/66
3,808,015	4/1974	Seufert	106/65
3,814,782	6/1974	Hayes et al.	106/65
3,849,181	11/1974	Green	106/65

1. A shaped, fired, transparent refractory fiber having at least one microcrystalline phase, the fiber comprising a composition of 10–75% Al_2O_3, 1–30% Cr_2O_3 and 10–75% RO_2 wherein R is selected from silicon, titanium, zirconium or tin wherein the fibers having more than 60% Al_2O_3 have a specific surface area of less than 30 m^2/g.

B 503,817

SOLID PHASE SYNTHESIS OF PEPTIDES WITH CARBOXYL-TERMINAL AMIDES

Erhard Gross, Bethesda, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Sept. 6, 1974, Ser. No. 503,817

Int. Cl.² C07C *103/52;* **C07G** *7/00*

U.S. Cl. 260—112.5 R **10 Claims**

References Cited

UNITED STATES PATENTS

3,732,199	5/1973	Schwarz	260/112.5
3,743,628	7/1973	Bodanszky et al.	260/112.5
3,775,378	11/1973	Dahlmans et al.	260/112.5
3,819,607	6/1974	Heuser et al.	260/112.5

1. A method of synthesizing peptides by solid phase procedure which comprises attaching an α,β-unsaturated amino acid through the teriminal carboxyl group to a solid insoluble support with the α-nitrogen blocked by a protecting group and subsequently unblocking the α-nitrogen by removing said protecting group and growing the peptide chain on said support by sequentially adding amino acids conforming to the desired peptide sequence and adding an acidic aqueous release solution to said peptide and support to convert the α,β-unsaturated amino acid to a carboxyl terminal amide and releasing said amide from said solid support.

B 508,369

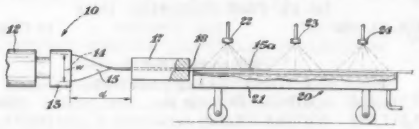
METHOD FOR THE EXTRUSION OF FOAM SHAPES

Kun Sup Hyun, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 23, 1974, Ser. No. 508,369
Int. Cl.² B29D 27/00; B29F 3/00
U.S. Cl. 264—51 **4 Claims**

References Cited
UNITED STATES PATENTS

3,258,515	6/1966	Brown	264/167
3,426,111	2/1969	Simpson	264/51
3,795,729	3/1974	Asakura et al.	264/46.1



1. In a method for the preparation of an elongate synthetic resinous thermoplastic extruded foamed article wherein a heat-plastified synthetic resinous extrudable foamable composition is passed under pressure through a die, the die having an orifice, the orifice having an elongate cross-sectional configuration having a major axis wherein the ratio of the major dimension of the cross-sectional configuration of the die orifice to the minor dimension thereof is at least 2 to 1 and the foamable composition is extruded from the orifice to form a heat-plastified unsupported extrudate which foams to provide a plurality of closed gas filled cells and passing the foamed extrudate through a reshaping die having an extrudate receiving and shaping channel therein wherein the channel has a cross-section which is elongate and has a major to minor axes ratio of at least 2, cooling the extrudate within the channel to a generally self-supporting shape and subsequently cooling the resultant extrudate to about ambient temperature, the improvement which comprises extruding the extrudate with the major axis of the cross-section of the extrudate in a generally vertical plane and rotating the major axis of the extrudate to a generally horizontal plane at an entrance to the shaping channel.

B 520,256

5-ALKYL-10-(AMINOCARBONYL/AMINOMETHYL/-CYANO)-10,11-DIHYDRO-5H-DIBENZ[B,F]AZEPINE-10-LKANAMINES

John W. Custic, Skokie, and Charles R. Ellefson, Chicago, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Nov. 4, 1974, Ser. No. 520,256
Int. Cl.² C07D 223/22
U.S. Cl. 260—239 D **15 Claims**

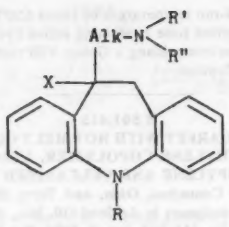
References Cited
UNITED STATES PATENTS

R27,622	4/1973	Schindler et al.	260/239 D

FOREIGN PATENTS OR APPLICATIONS

1,355,948	4/1972	France	260/239 D

1. A compound of the formula



wherein X represents aminocarbonyl aminomethyl, or cyano; Alk represents alkylene containing two or three carbons; R and R′ each represent alkyl containing fewer than eight carbons; and R″ represents hydrogen, alkyl containing fewer than eight carbons, or benzyl.

B 524,179

DIHYDRO-A204

James W. Chamberlin, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 15, 1974, Ser. No. 524,179
Int. Cl.² A61K 35/00
U.S. Cl. 424—122 **1 Claim**

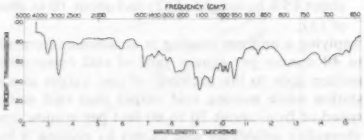
References Cited
UNITED STATES PATENTS

3,705,238	12/1972	Hamill et al.	260/345.9

OTHER PUBLICATIONS

Jones et al., J. Amer. Chem. Soc., 95, 3399 (1973).

INFRARED ABSORPTION SPECTRUM OF DIHYDRO-A204



1. Dihydro-A204, which is a white amorphous solid, soluble in diethyl ether, dimethylformamide, dimethyl sulfoxide, methyl acetate, ethyl acetate, amyl acetate; sulfoxide, acetone, methyl ethyl ketone, methyl isobutyl ketone; chloroform, carbon tetrachloride, dichloroethylene; benzene, toluene, xylene, methanol, ethanol, isopropanol and tert-butanol; and insoluble in water; and which has:

a. a molecular weight, as determined by the osmometric method, of 944;
b. an approximate elemental composition of 63.64% carbon, 9.11% hydrogen and 27.25% oxygen;
c. an empirical formula of $C_{50}H_{88}O_{16}$;
d. an infrared absorption spectrum in chloroform with distinguishable absorption maxima at 2.96, 3.40, 5.78 (strong), 5.95, 6.87, 7.30, 7.83, 9.00 (strong), 9.13, 9.42, 9.58, 9.87, 10.10, 10.25, 10.53 and 10.80 microns;
e. a nuclear magnetic resonance spectrum with the following characteristics: ($CDCl_3$) δ 3.30, 3.36, 3.43, 3.46 (CH_3O), 4.80 (-CH-O-) ppm;
f. in 66 percent aqueous dimethylformamide, one titratable group having a pKa of about 5.45; and
g. Rf values of 0.26 and 0.33 on silica-gel thin-layer chromatography in ethyl acetate-methanol (9:1); and which forms cationic salts, the sodium salt thereof having an infrared absorption spectrum in chloroform with absorp-

tion maxima at 3.0 (OH), 5.8, and 6.3 (CO_2^-) microns; or the physiologically-acceptable cationic salts thereof.

B 525,961

METHOD OF PRODUCING A HIGH STRENGTH COMPOSITE OF ZIRCON

Robert N. Sanders, 1875 N. Vega Drive, Baton Rouge, La. 70815

Continuation of Ser. No. 349,228, April 9, 1973, abandoned, which is a division of Ser. No. 210,127, Dec. 20, 1971, abandoned. This application Nov. 21, 1974, Ser. No. 525,961

Int. Cl.² C22C *1/10, 21/00*

U.S. Cl. 75—135 **6 Claims**

References Cited

UNITED STATES PATENTS

2,793,949	5/1957	Imich	75/135
2,949,358	8/1960	Alexander	75/176
3,468,658	9/1969	Herald	75/122

1. A method for producing a high-strength aluminum composite product containing aluminum as the principal metal and a dispersion therein of a non-metal particulated filler substantially insoluble in the aluminum, which method comprises the following steps: bringing together with stirring a) a quantity of molten aluminum heated to a temperature of about 800 to about 850°C to achieve good fluidity, b) about 5 to about 80 percent zircon by weight of the composite, the zircon having a particle size of about 60 mesh to about 400 mesh U.S. Sieve Series, and c) about 2 to about 10 percent alkaline earth metal by weight of the metallic phase of the composite, continuing the stirring to cause the alkaline earth metal to reduce only the surfaces of the zircon particles and because of such reduction to cause the zircon particles to become substantially stably dispersed throughout the molten metallic phase, and casting the resulting dispersion in a mold to solidify the molten portion and give the composite the desired configuration.

B 526,997

WATER REDUCIBLE EPOXY ESTER COATING COMPOSITION

Michael A. Tobias, Somerville, N.J., and Richard A. Lamanna, Jefferson Borough, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,997

Int. Cl.² C08G *51/24*

U.S. Cl. 260—29.2 EP **11 Claims**

References Cited

UNITED STATES PATENTS

2,857,354	10/1958	Fang	260/33.2
3,649,583	3/1972	Guthrie	260/30.4 EP
3,844,998	10/1974	Jeffery et al.	260/47 EP

OTHER PUBLICATIONS

Handbook of Epoxy Resins Lee et al., 1967, (pp. 11–18; 12–22; 23; 13–9; 10; 24–29)

1. An epoxy ester comprising an ester adduct of a polyfunctional epoxy resin containing more than one 1,2-epoxy group and a monofunctional 1,2-epoxy with a saturated dibasic acid the ratio of said polyfunctional epoxy resin to said monofunctional epoxy being 3–5 based upon epoxide equivalent weight, the ratio of equivalents of said dibasic acid to total epoxide being 1.0–1.2 and trimellitic anhydride, the ratio of anhydride equivalents in said trimellitic anhydride to total epoxide being 0.1–0.3; the reaction between said epoxy resin, said monofunctional epoxy, and said dibasic acid being carried out in a solvent at elevated temperature until the alcoholic acid number is 3–22 and the epoxy content is 0.025–0.035 meq./g to obtain an initial ester and reacting said initial ester with trimellitic anhydride at a lower elevated temperature until the alcoholic acid number and the aqueous acid number are substantially equal.

B 530,318

6-METHYL-8-(SUBSTITUTED) METHYLERGOLINES

Edmund C. Kornfeld, and Nicholas J. Bach, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 6, 1974, Ser. No. 530,318

Int. Cl.² C07D *519/02*

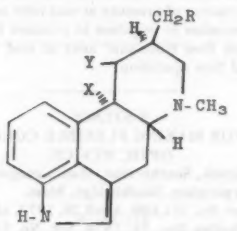
U.S. Cl. 260—285.5 **7 Claims**

References Cited

UNITED STATES PATENTS

3,557,118	1/1971	Arcamone et al.	260/285.5
3,732,231	5/1973	Temonsky et al.	260/285.5

1. A compound of the formula



wherein:

X and Y each are hydrogen or, taken together, form a double bond;

R is nitro, isocyano, or CH_2R_1;

wherein:

R_1 is methylsulfinyl;

and the non-toxic pharmaceutically-acceptable acid addition salts thereof.

B 532,901

LIQUID FILTER VALVE MEANS

Louis A. Bumb, Toledo, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 16, 1974, Ser. No. 532,901

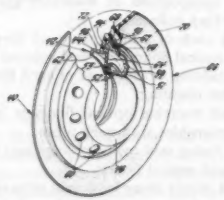
Int. Cl.² B01D *35/14*

U.S. Cl. 210—130 **3 Claims**

References Cited

UNITED STATES PATENTS

3,083,832	4/1963	Hathaway et al.	210/DIG. 17
3,231,089	1/1966	Thornton	210/130
3,262,567	7/1966	Pall et al.	210/130
3,332,554	7/1967	Humbert, Jr.	210/DIG. 17



1. A liquid filter comprising a canister having an open end, a filter cartridge inserted through said open end into said canister, a closure member closing said open end of said

canister having an inlet for delivering liquid to said filter cartridge and an outlet for receiving filtered liquid from said filter cartridge, and a subassembly mounted as a unit in said canister between said filter cartridge and said closure member just prior to assembly of said closure member comprising a pair of joined collars for supporting said filter cartridge in proper position in said canister relative to said inlet and said outlet, said collars having a bypass passage therein between said inlet and said outlet bypassing said filter cartridge, one of said collars further having a bypass valve seat in said bypass passage, an annular metal spring bypass valve member clamped between said collars for normally seating on said bypass valve seat to close said bypass passage below a predetermined pressure differential across said filter cartridge and lifting off said bypass valve seat above said predetermined pressure differential to open said bypass passage to bypass liquid from said inlet past said filter cartridge directly to said outlet, and a rubber or rubberlike anti-drainback valve member mounted on said collars and seating on said closure member to prevent liquid in said canister from draining to said outlet in the absense of pressure at said inlet and lifting off of said closure member in response to pressure build-up at said inlet to permit flow from said inlet to said filter cartridge during normal flow operation.

B 532,969

METHOD FOR MAKING FLEXIBLE COLORED FIBER OPTIC DEVICE

Richard R. Strack, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 354,600, April 26, 1973, abandoned. This application Dec. 16, 1974, Ser. No. 532,969

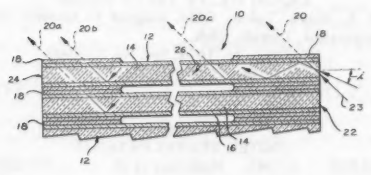
Int. Cl.² C03C *25/02, 23/20, 15/00*

U.S. Cl. 65—3 A **5 Claims**

References Cited

UNITED STATES PATENTS

3,247,756	4/1966	Siegmund	65/DIG. 7
3,387,959	11/1968	Cole	65/4
3,554,721	1/1971	Gardner	65/31
3,624,816	11/1971	Strack	65/31
3,690,853	9/1972	Law	65/31
3,830,667	8/1974	Carpenter	65/4



1. The method of forming a flexible fiber optic image-transmitting conduit comprising the steps of:

preparing a composition of leachable glass containing a light-absorbing colorant;

overcladding each of a multiplicity of long and thin glass clad glass optical fibers with said colored leachable glass, said overcladding in each case of each fiber comprising a second fiber cladding;

arranging said overclad optical fibers in intimately juxtaposed relationships with each other;

heating and fusing said overcladdings together as a matrix between said optical fibers;

leaching said matrix away from said optical fibers throughout a substantial portion of their lengths intermediately of corresponding opposite ends thereof while leaving an appreciable amount of said matrix adjacent each of said opposite ends of said fibers as fiber interconnecting and stray light-absorbing means.

B 535,944

PROCESS FOR PREPARING A HEAT COAGULABLE VISCOUS PROTEIN PRODUCT

Michael Shemer, Worthington, Ohio, assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Dec. 23, 1974, Ser. No. 535,944

Int. Cl.² A23J *3/00, 1/14*

U.S. Cl. 426—276 **16 Claims**

References Cited

UNITED STATES PATENTS

2,670,291	2/1954	Melnick	426/431 X
2,785,155	3/1957	Anson et al.	426/431 X
3,579,496	5/1971	Martinez et al.	426/431 X
3,870,801	3/1975	Tombs	426/276 X

1. A process for producing a heat coagulable viscous protein product substantially free of added salts which comprises:

a. forming an aqueous slurry of an oleaginous seed material present at a solids concentration of less than about 15 percent (weight/volume basis) based upon the total volume, said slurry having a pH of about 5.1 to about 5.9;

b. separating the liquid from the solids portion of said slurry; and

c. recovering said protein product from said separated liquid.

B 536,935

SUBSTITUTED 7,12-METHANO DIBENZAZOCINES

William H. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz, Inc., Hanover, N.J.

Filed Dec. 23, 1974, Ser. No. 536,935

Int. Cl.² C07D *225/04*

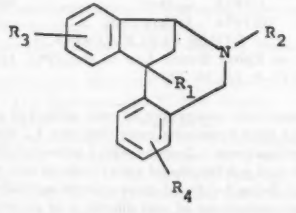
U.S. Cl. 260—239 D **15 Claims**

References Cited

UNITED STATES PATENTS

3,496,165	2/1970	Houlihan et al.	260/239 D
3,642,777	2/1972	Houlihan et al.	260/239 D

1. A compound of the formula:



where

R_1 is straight chain lower alkyl

R_2 is hydrogen or lower alkyl and

R_3 and R_4 each independently is hydrogen, halo having an atomic weight of about 19 to 35, lower alkyl or lower alkoxy and pharmaceutically acceptable acid addition salts thereof.

B 537,102
PROCESS FOR THE PREPARATION OF CARBODIIMIDE-ISOCYANURATE FOAMS

Moses Cenker, Trenton; Thirumurti L. Narayan, Riverview, and Peter T. Kan, Plymouth, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

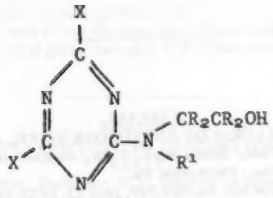
Filed Dec. 30, 1974, Ser. No. 537,102
Int. Cl.² C08G *18/14, 18/20*
U.S. Cl. 260—2.5 AC 9 Claims

References Cited
UNITED STATES PATENTS

3,573,301	3/1971	Winter	260/2.5 AW
3,620,986	11/1971	Djehr et al.	260/2.5 AW
3,644,168	2/1972	Bonk et al.	260/2.5 AW
3,645,923	2/1972	Kan	260/2.5 BF
3,725,319	4/1973	Frisch	260/2.5 AJ
3,748,289	7/1973	Cenker et al.	260/2.5 BF
3,803,064	4/1974	Fishbein et al.	260/2.5 AW
3,806,475	4/1974	Narayan et al.	260/2.5 BF

1. A process for the preparation of a foam characterized by carbodiimide and isocyanurate linkages which comprises condensing an organic polyisocyanate in the presence of a catalyst system comprising based on 100 parts by weight of organic polyisocyanate

a. from 0.1 part to 10 parts by weight of an s-triazine compound selected from the group consisting of 2,4,6-tris(-diethanolamino)-s-triazine, 2,4,6-tris(diisopropanolamino)-s-triazine, 2,4,6-tris(dibutanolamino)-s-triazine, 2,4,6-tris(N-methylethanolamino)-s-triazine, and unsymmetrically substituted triazines of the formula:



wherein R is hydrogen or lower alkyl of from 1 to 10 carbon atoms, R^1 is CR_2CR_2OH or lower alkyl of from 1 to 12 carbon atoms, X is NR_2, alkoxy of from 1 to 12 carbon atoms, phenoxy, alkyl of from 1 to 12 carbon atoms, phenyl, hydroxyl, halogen, aziridyl, pyrrolidyl, piperidyl, or N-alkylpiperazyl,

b. from 1 part to 6 parts by weight of a 1,3,5-tris(N,N-dialkylaminoalkyl)-s-hexahydrotriazine or the alkylene oxide and water adducts thereof, and

c. from 0.01 part to 5 parts by weight of a phenolic compound selected from the group consisting of phenol, methylphenols and halophenols.

B 537,711
ISOCYANURATE COMPOUNDS

William J. Kauffman, 20 Pfautz Ave., Lititz, Pa. 17543

Filed Dec. 31, 1974, Ser. No. 537,711
Int. Cl.² C07D *251/30*
U.S. Cl. 260—248 NS 2 Claims

References Cited
UNITED STATES PATENTS

3,235,553	2/1966	Sadle	260/248
3,249,607	5/1966	Taub et al.	260/248

1. 1,3-bis(3-carbethoxypropyl)-5-phenylisocyanurate.

B 542,158
AMINO-BENZIMIDAZOLE DERIVATIVES

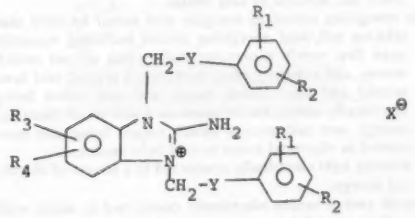
Harry L. Yale, New Brunswick, and James A. Bristol, Boonton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 20, 1975, Ser. No. 542,158
Int. Cl.² C07D *235/30*
U.S. Cl. 260—309.2 12 Claims

References Cited
OTHER PUBLICATIONS

Berg et al., Chem. Abst. 1962, Vol. 56, columns 11582–11584.
Reddy et al., Chem. Abst. 1970, Vol. 72, No. 31695w.
Shelepin et al., Chem. Abst. 1970, Vol. 73, No. 76345u.
Yutilov et al., Chem. Abst. 1965, Vol. 63, column 16335.

1. A compound of the structure



wherein

Y is oxygen or sulfur;

R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, halo, lower alkyl, lower alkoxy, trifluoromethyl or N,N-dimethylsulfonamido;

R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halo, phenyl, naphthyl, phenyl lower alkyl, naphthyl lower alkyl, or phenyl or naphthyl substituted with an R_1 or R_2 group; and

X is selected from the group consisting of Cl, Br or I.

B 543,941

CONTROL MEANS AND AUTOMATIC ROLL-TYPE FILTER

Alan E. Revell, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 376,672, July 5, 1973, abandoned. This application Jan. 24, 1975, Ser. No. 543,941

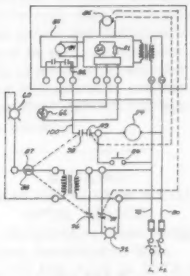
Int. Cl.² B01D *46/18*

U.S. Cl. 55—352 **3 Claims**

References Cited

UNITED STATES PATENTS

3,324,633 6/1967 Revell 55/354



1. An air filtering apparatus comprising: a filter media supply roll to receive a roll of filter media; a filter media take-up roll to receive filter media from said supply roll; an air filtering zone disposed between said supply roll and said take-up roll; filter media extending from said media supply roll through said air filtering zone to said filter media take-up roll, so air can be treated passes through said filter media in said air filter zone; and an adjustable, fail-safe air filter media advanced control system responsive to a reduction in the light transmitting quality of said media, said filter media advanced control system comprising:

an electric light source of controlled intensity disposed on one side of said filter media and electrically connected to a source of electrical energy, and a photocell disposed on the opposite side of said filter media from said light source and connected to a source of electrical energy;

an electric motor drivingly connected to said take-up roll to effect the advance of said media;

an energizing circuit to energize said motor to drive said take-up roll, said energizing circuit including normally open first switch means, normally open second switch means, and normally open third switch means, said first, second and third switch means and said motor being electrically connected in series to a source of electrical energy, and said second switch means being also connected in electrical series to said light source;

a warning light electrically connected to a source of electrical energy;

fourth switch means electrically connected in series with said warning light to the source of electrical energy;

fifth switch means electrically connected to said warning light and parallel to said fourth switch means;

a rheostat electrically connected in series with said photocell and in parallel to said first switch means, said rheostat enables a resistance value to be preselected which when exceeded by the resistance of said photocell initiates activation of said first switch means to energize said motor to drive said take-up roll;

a resistor electrically connected in series with said rheostat and said photocell, said resistor being of sufficient value to prevent said rheostat from being adjusted to such a low resistance value that said first switch means is activated to advance said media when clean media is present in said air filtering zone;

first relay means electrically connected to said first switch means for activating said first switch means, said first relay means being electrically connected to said photocell and parallel with said rheostat and said resistor to close said first switch means when the resistance of said photocell exceeds the resistance of said rheostat due to the quantity of light received by said photocell falling below a first predetermined value;

second relay means electrically connected to said second and fifth switch means for activating said second and fifth switch means, said second relay means being electrically connected in series with said light source to close said second switch means and open said fifth switch means when said light source is energized; and,

third relay means electrically connected to said third and fourth switch means, said third relay means being electrically connected to said photocell in series with said rheostat and said resistor and in parallel with said first relay means, said third relay means has less resistance than said first relay means, said third relay means to close said third switch means and open said fourth switch means when the resistance of said photocell exceeds the resistance of said third switch means and is less than the resistance of said rheostat and said resistor due to the quantity of light received by said photocell falling below a second predetermined value, said second predetermined value being higher than said first predetermined value,

whereby said motor is energized when said first, second and third switch means are each in a closed position, said warning light is energized and said motor de-energized when said fifth switch means is closed and said second switch means is open indicating the light source is de-energized, and said warning light is energized and said motor de-energized when said fourth switch means is closed and said third switch means is open indicating that the filter media has been exhausted from said air filtering zone.

B 549,198

PREPARATION OF ANHYDROUS NITRIC ACID

Clifford L. Coon, Menlo Park, Calif., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 369,309, June 12, 1973, abandoned. This application Feb. 12, 1975, Ser. No. 549,198

Int. Cl.² C01B *21/46*; **C07C** *79/12*

U.S. Cl. 423—390 **9 Claims**

References Cited

OTHER PUBLICATIONS

Genich et al., "Izv. Akad. Nauk. Ser. Khim.," USSR, 1966, pp. 66–69, Abst. "Chemical Abst." Vol. 64. p. 15183.

Plesch et al., "Chemistry & Industry" Sept. 1971, pp. 1043–1044.

1. A method for preparing a solution of anhydrous nitric acid in methylene chloride comprising extracting an aqueous mixture of nitric acid and sulfuric acid with methylene chloride.

4. A method for preparing anhydrous nitric acid comprising:

a. preparing an aqueous solution of nitric acid and sulfuric acid;

b. extracting the aqueous acid mixture with methylene chloride;

c. separating the anhydrous nitric acid from the methylene chloride raffinate.

B 552,498
3-(HYDROXYHYDROCARBYLSECONDARYAMINO)THIOPHENE 1,1-DIOXIDES AND POLYURETHANES CHAIN EXTENDED THEREWITH

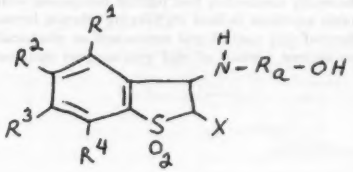
Chung-Ling Mao, Sandy Hook, Conn., assignor to Uniroyal Inc., New York, N.Y.

Division of Ser. No. 434,470, Jan. 18, 1974, Pat. No. 3,887,503. This application Feb. 24, 1975, Ser. No. 552,498
Int. Cl.² C07D *333/66*
U.S. Cl. 260—330.5 **7 Claims**

References Cited
UNITED STATES PATENTS

2,553,495	5/1950	Avakian et al.	260/330.5
3,887,503	6/1975	Mao	260/2.5 AM

1. A 3-(hydroxyhydrocarbylsecondary-amino)-2,3-dihydrobenzo(b) thiophene 1, 1-dioxide of the following formula



wherein

X may be hydrogen, an alkyl group having 1 to 5 carbon atoms or a halogen atom,

R_a may be (1) an open chain alkylene group having 2 to 10 carbon atoms (2) an open chain alkylene group having 2 to 10 carbon atoms substituted with one or more phenyl groups, or (3) a cycloalkylene group having 4 to 8 carbon atoms,

the hydroxyl group being attached to a carbon atom of R_a that is separated from the secondary amino nitrogen atom by at least one carbon atom, and

R^1, R^2, R^3 and R^4 are the same or different and are hydrogen, an alkyl group having 1 to 5 carbon atoms, or halogen.

B 562,462
ALTITUDE COMPENSATED CARBURETOR FLOAT VALVE

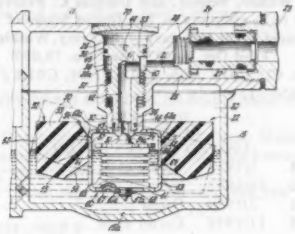
Earl R. Fischer, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1975, Ser. No. 562,462
Int. Cl.² F02M *5/06*
U.S. Cl. 261—39 A **3 Claims**

References Cited
UNITED STATES PATENTS

1,103,803	7/1914	Meissner	137/426
1,290,883	1/1919	Blanning	137/426
1,532,291	4/1925	Woolson	261/39 A
1,814,804	7/1931	Heftler	137/432
2,111,855	3/1938	Groh	261/39 A
2,619,959	12/1952	Holmes	137/81
3,051,193	8/1962	Griffen	261/70

1. In a carburetor having body means arranged to provide a fuel reservoir chamber, a vertical bore through said body means opening into said chamber, a substantially horizontal inlet passage in said body means extending to said vertical bore, a cylindrical inlet seat member adjustably secured in said vertical bore in sealed relation thereto, passage means in said inlet seat member in communication with said vertical bore and said inlet passage, said passage means including a tubular valve seat member having an annular valve seat open to said fuel reservoir chamber and, a float aneroid assembly positioned in said fuel reservoir chamber, said float aneroid assembly including a float of toroidal configuration and an aneroid mounted concentrically therein with one end of said



aneroid fixed relative to said float and with its opposite end free for axial movement relative to said float and a semispherical valve fixed to said opposite end of said aneroid in position to co-act with said valve seat to control flow of fuel into said fuel reservoir chamber.

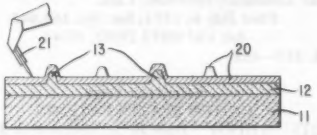
B 563,722
REMOVAL OF PROJECTIONS ON EPITAXIAL LAYERS

William Charles Erdman, deceased, late of Danielsville, Pa. (by Charlotte Erdman, executrix), and Lewis Emanuel Katz, Allentown, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 31, 1975, Ser. No. 563,722
Int. Cl.² H01L *21/304*
U.S. Cl. 156—3 **5 Claims**

References Cited
UNITED STATES PATENTS

3,699,644	10/1972	Cocca	29/583
3,718,514	2/1973	Erdman et al.	156/17
3,738,881	6/1973	Erdman et al.	156/17
3,783,044	1/1974	Cheskis et al.	156/17
3,838,501	10/1974	Umbaugh et al.	29/583



1. The method of removing projections from the surface of a semiconductor layer epitaxially deposited onto a substrate comprising

a. forming on said surface a coating of an inorganic dielectric material having a thickness less than the height of at least a portion of the projections,

b. traversing tool means across said coated surface to fracture at least the coating on all the projections,

c. treating said coated surface with an etchant which selectively attacks the semiconductor projections to thereby remove said underlying projections.

B 079,099

SOIL SAMPLE CONDUCTIVITY MEASUREMENT UTILIZING A BRIDGE CIRCUIT AND PLURAL ELECTRODE CELL

John W. Walker, Belmar, and Douglas C. Pearce, Sea Girt, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 8, 1970, Ser. No. 79,099

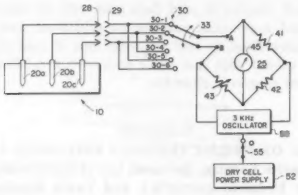
Int. Cl.[2] G01V *3/06;* **G01N** *27/04;* **G01R** *27/00*

U.S. Cl. 324—13 **2 Claims**

References Cited

UNITED STATES PATENTS

2,583,284	1/1952	Wyllie et al.	324/13 X
2,613,250	10/1952	Bilhartz et al.	324/13 X
2,875,401	2/1959	Owen	324/13
2,914,725	11/1959	Carter et al.	324/30



2. Apparatus for determining the conductivity of a soil sample comprising a calibrated fluid-tight cell filled with a sample of soil to be analyzed, a pair of electrodes chemically inert to salts and acids within said soil, said electrodes projecting into a soil containing portion within said cell and connectable externally of said cell, a resistance measuring bridge circuit, and means for connecting said soil electrodes into a portion of said bridge circuit, said bridge circuit including a current supply of unknown magnitude and a frequency between 1.5 kHz and 10 kHz.

B 160,045

GRIDDED CONVERGENT FLOW ELECTRON GUN FOR LINEAR BEAM TUBES

George V. Miram, San Mateo County, and Gerhard B. Kuehne, Santa Clara County, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed July 6, 1971, Ser. No. 160,045

Int. Cl.[2] H01J *29/02, 29/46*

U.S. Cl. 313—452 **5 Claims**

References Cited

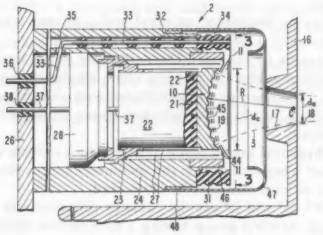
UNITED STATES PATENTS

2,861,213	11/1959	Dalman	313/82 R X
3,185,882	5/1965	Dryden et al.	313/83
3,255,374	6/1966	Drees et al.	313/292 X
3,484,642	12/1969	Kreuchen	313/292 X
3,484,645	12/1969	Drees	313/296 X
3,558,967	1/1971	Miram	313/3.5
3,651,360	3/1972	Sommeria	313/82 R

FOREIGN PATENTS OR APPLICATIONS

1,919,451	11/1969	Germany	313/82 R

1. In an electron gun; an evacuable envelope structure; thermionic cathode emitter means having a concave emitting surface generally approximating a figure of revolution for emitting a stream of electrons; an accelerating anode means spaced from said cathode emitter and having a central aperture of substantially smaller diameter than the diameter of the concave emitting surface of said cathode emitter, such anode central aperture being disposed in axial alignment with the axis of revolution of said concave emitting surface of said cathode emitter for accelerating and converging a stream of electrons through said aperture into a linear beam of electrons; a multi-apertured concave control grid means disposed overlaying said concave emitting surface of said cathode emitter in spaced relation therefrom for controlling the beam current drawn from said cathode through the apertures in said control grid means; control grid support means for supporting said control grid from the periphery thereof and disposed in electrically insulative and substantially thermally insulative relation relative to said cathode emitter means; said control grid support means being connected in heat exchanging relation with said control grid and including, a thermally conductive support structure surrounding said cathode emitter in thermally insulative relation thereto and thermally communicating through the evacuable envelope of the gun to the surrounds for conducting heat from said control grid to the surrounds of the electron gun and having an electrically insulative thermally conductive first portion interposed within said evacuable envelope in heat exchanging relation between the periphery of said control grid means and an electrically conductive second portion of said grid support structure, said



second portion being in physical contact with a portion of said evacuable envelope, said second portion of said grid support structure includes a tubular metallic member surrounding said cathode emitter, and said first portion includes an annular ceramic member joined at one end to said tubular metallic second portion and at the other end to the periphery of said control grid means, a multi-apertured concave focus grid means interposed between said cathode emitter and said multi-apertured control grid means in thermally insulative relation relative to said cathode emitter for focusing the electrons drawn from said cathode emitter through the apertures in said multi-apertured control grid means, the apertures in said focus grid means being aligned along the direction of the convergent beam path with the apertures in said control grid means, a third portion of said grid support means being interposed in heat exchanging relation between the periphery of said focus grid and said second portion of said grid support structure for supporting said focus grid means, and wherein said second portion of said grid support structure is common to said control grid means and said focus grid means for defining a unitary support structure portion providing common support to both of said grid means.

B 248,240

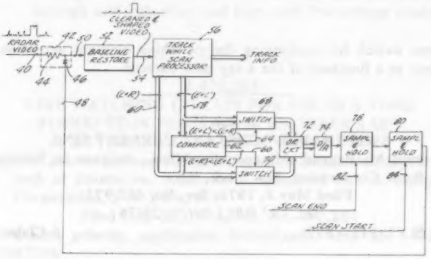
RADAR VIDEO CLIPPING LEVEL DERIVED FROM TARGET SIGNAL

Paul M. Danzer, Norwalk, and Giles E. Rae, Ridgefield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 27, 1972, Ser. No. 248,240
Int. Cl.² G01S 7/28
U.S. Cl. 343—7 A **5 Claims**

References Cited
UNITED STATES PATENTS

3,603,994	9/1971	Williams et al.	343/7.3
3,611,369	10/1971	Maguire	343/7 A
3,701,149	10/1972	Patton et al.	343/7 A X



1. In a scanning pulse radar system having processing means providing signals representing the summation of early and late target return signal voltages and the summation of right and left target return signal voltages in response to target return signal voltage levels in a multi-phase target window, and having a radar video clipper responsive to a reference voltage for cleaning and shaping radar video prior to application to the processing means, the improvement comprising:

means for developing a clipping level voltage proportional to at least one of the signals included in the group of the left and right summation signals and the early and late summation signals in one scan; and

means for applying said clipping level voltage in a next succeeding scan as the reference voltage of the radar video clipper.

B 279,969

LUMINESCENT SCREEN OF A COLOUR TELEVISION TUBE

Hans Dignus Duinker, and Gerardus Antonius Wilhelmus Vermeulen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 11, 1972, Ser. No. 279,969
Claims priority, application Netherlands, Aug. 18, 1971, 7111362
Int. Cl.² H01J 31/12, 29/18
U.S. Cl. 313—477 **1 Claim**

References Cited
UNITED STATES PATENTS

3,569,761	5/1971	Lange	117/33.5 CM
3,615,460	10/1971	Lange	117/33.5 CM
3,632,339	1/1972	Khan	117/33.5 CM
3,661,581	5/1972	Feldstein	117/33.5 CM
3,677,757	7/1972	Nishizawa	117/33.5 CM
3,681,111	8/1972	Kaplan	117/33.5 CM
3,695,871	10/1972	Lange	117/33.5 CM
3,708,336	1/1973	Nishizawa et al.	117/33.5 CM
3,734,728	5/1973	Kachel	117/33.5 CM

1. A cathode-ray tube for displaying color pictures, comprising: a transparent window having an undulated inner surface including undulations with a wavelength between 0.2 and 0.02 cm; a luminescent screen provided on said inner surface and including a plurality of luminescent areas which upon excitation by electrons luminesce in different colors, said areas being separated by light absorbing material, a shadow mask having a plurality of apertures, said apertures exceeding at least one dimension of assigned luminescent areas, said surface undulations with wavelengths between 0.2 cm and 0.02 cm having a depth less than 1 micron.

B 394,350

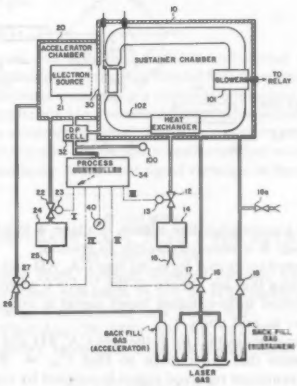
ELECTRON BEAM GAS DISCHARGE LASER PRESSURE CONTROL

Ethan D. Hoag, Boston, and Henry E. Pease, Malden, both of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Sept. 4, 1973, Ser. No. 394,350
Int. Cl. H01s 3/22
U.S. Cl. 331—94.5 P **9 Claims**

References Cited
UNITED STATES PATENTS

3,789,321	1/1974	Krawetz	331/94.5



1. Method of operating a two chamber gas laser of the type having an accelerator chamber and a sustainer chamber separated from each other by a thin diaphragm comprising:

continuously sampling pressures from each of said chambers during simultaneous pumpdown thereof and generating continuously a pressure differential signal and applying said signal to modulate the rate of accelerator chamber pumpdown during initial pumpdown of said two chambers,

continuing said continuous generation of a pressure differential signal and applying said signal to modulate the rate of backfill of the sustainer chamber,

then during laser operation continuing said continuous generation of a pressure differential signal and modulating sustainer chamber pressure thereby,

and maintaining the pressure differential across said diaphragm within 2/10 of an atmosphere throughout said operations.

B 399,908

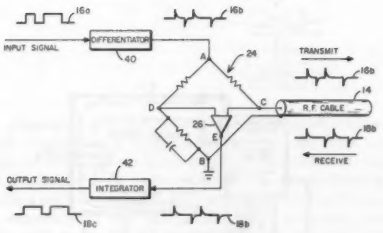
FULL-DUPLEX DIGITAL TRANSMISSION LINE SYSTEM

Ernest S. Griffith, St. Louis, and William W. Davis, Minneapolis, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 24, 1973, Ser. No. 399,908
Int. Cl.² H04L 5/14; H04B 3/50
U.S. Cl. 178—58 R **6 Claims**

References Cited
UNITED STATES PATENTS

1,619,041	3/1927	Salinger	178/60
3,566,031	2/1971	Carbone	178/59
3,704,346	11/1972	Smith	179/18 BE
3,730,993	5/1973	Moriyasu	178/59
3,775,561	11/1973	Guckel	178/58 R
3,812,292	5/1974	Tink	179/2 DP



5. The transmission line system of claim 4 in which:
said node B is coupled directly to ground;
said impedances that form the legs CA, AD and DB include resistors that are chosen so the $V_{DC} = 0$ when said power amplified differentiated input signal is coupled by said driver to said node A;
said impedances that form the legs CA, AD and DB include resistors that are chosen so that $V_{DC} \neq 0$ when said differentiated received signal is coupled by said transmission line between said nodes B, C.

B 451,534

SWITCHING DEVICE FOR AN X-RAY GENERATOR COMPRISING A TIME SWITCH

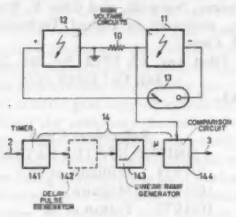
Heinz Mester, and Gerd Vogler, both of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 15, 1974, Ser. No. 451,534
Claims priority, application Germany, Mar. 22, 1973, 2314267
Int. Cl.² H05G 1/30
U.S. Cl. 250—402 **12 Claims**

References Cited
UNITED STATES PATENTS

2,668,909	2/1954	Johnston	250/415

1. In a switching device for an x-ray generator of the type including a high voltage transformer for supplying current to the x-ray tube and a switching element connected in the transformer primary circuit, the improvement comprising a time switch for controlling the actuation time of the switching element wherein the actuation time of the switching element is longer than the exposure time, and means coupled to the



time switch for prolonging the switching element actuation time as a function of the x-ray tube current.

B 467,971

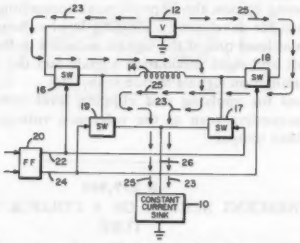
SWITCHABLE CONSTANT CURRENT SINK

Vernal M. Benrud, Minneapolis, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 8, 1974, Ser. No. 467,971
Int. Cl.² H01J 29/70, 29/76
U.S. Cl. 315—399 **6 Claims**

References Cited
UNITED STATES PATENTS

3,431,457	3/1969	Hinkein et al.	315/367
3,435,278	3/1969	Carlock et al.	315/367
3,582,705	6/1971	Waller	315/367



1. A switchable constant current sink for a CRT display system comprising:
a first transistor T1 having collector, emitter and base electrodes;
a first resistor R1;
a first diode D1 having an anode and a cathode;
means directly intercoupling the collector electrode of said first transistor T1 and the cathode of said first diode D1 for forming a first node;
means coupling the emitter electrode of said first transistor T1 directly to a first terminal of said first resistor R1 the second terminal of which is coupled directly to ground;
V_{REFX} reference voltage source means coupled to said transistor T1 constantly forward biasing the base emitter junction of said first transistor T1 for controlling a current I_{T1} to constantly flow from said first node, through said first transistor T1 and then through said first resistor R1 to ground;
a second transistor T3 having collector, emitter and base electrodes;
means coupling the emitter electrode of said third transistor T3 to said first node;

a first voltage source V;

an inductive load formed by the X deflection coil of said CRT coupled intermediate said first voltage source V and the anode of said first diode D1;

a second voltage source V $+\Delta V$ coupled to the collector electrode of said third transistor T3;

logic means coupled to said second transistor T3 controlling said second transistor T3 to be either conducting ON or nonconducting OFF, respectively, said ON second transistor T3 coupling said second voltage source V $+\Delta V$ to said first node and reverse biasing said first diode D1 for drawing said current I_{T1} through said second transistor T3 from said second voltage source V $+\Delta V$, or, alternatively, said OFF second transistor T3 decoupling said second voltage source V $+\Delta V$ from said first node and forward biasing said first diode D1 for drawing said current I_{T1} through said inductive load from said first voltage source V.

B 472,284

LINE MATCHING CIRCUIT FOR USE IN A TONE PUSHBUTTON DIALLING SUBSCRIBER'S SET PROVIDED WITH A TONE GENERATOR

Daniel Johannes Gerardus Janssen, and Cornelis Maria Hart, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 22, 1974, Ser. No. 472,284

Claims priority, application Netherlands, May 25, 1973, 7307296

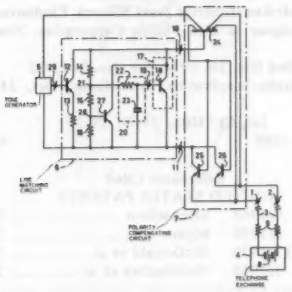
Int. Cl.² H04M *1/50, 1/00*

U.S. Cl. 179—81 R **5 Claims**

References Cited

UNITED STATES PATENTS

3,731,004	5/1973	Coupland	179/84 T
3,823,272	7/1974	Tabalba	179/81 A



1. Line matching circuit for matching the impedance of a tone generator in a subscriber's pushbutton dialling set with a transmission line connected thereto, comprising two terminals, means for coupling said two terminals to said transmission line, a signal controlled alternating-current source means coupling the tone generator to said two terminals for supplying alternating currents at tone signal frequencies thereto, a potentiometer connected between said terminals, a low-pass filter having its input connected to a first tap on said potentiometer and its output connected to the input of an amplifier, the output of said amplifier being connected between the terminals to control the amplitude of slowly varying DC currents flowing through said transmission line in order to maintain a constant DC voltage across said terminals.

B 476,681

METHOD OF AND DEVICE FOR DETECTING CYLINDRICAL MAGNETIC DOMAINS BY MEANS OF FERRIMAGNETIC RESONANCE

Horst Dötsch, Pinneberg; Jürgen Müller, Hamburg, and Hans-Jürgen Schmitt, Pinneberg, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 5, 1974, Ser. No. 476,681

Claims priority, application Germany, June 18, 1973, 2330963

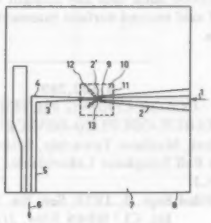
Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **6 Claims**

References Cited

UNITED STATES PATENTS

3,824,573	7/1974	Scarzello	340/174 TF
3,836,897	9/1974	Marsh	340/174 TF



1. A device for detecting movable cylindrical magnetic domains produced in a magnetic crystal film supported on one side of a substrate, comprising a coplanar conductor disposed on and shortcircuited in a restricted transfer region of the film to feed-in a microwave signal, and a slot conductor shortcircuited in the transfer region and transformed into a wide band coplanar conductor to feed out signal variation in the region.

B 501,482

DICED SUBSTRATE S.A.W. DEVICE FOR BULK WAVE ATTENUATION

Ronald George Pratt, Reigate; Richard Stevens, Copthorne, and Alojzy Karr, Shoreham by-sea, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1974, Ser. No. 501,482

Claims priority, application United Kingdom, Sept. 4, 1973, 41479/73

Int. Cl.² H01L *41/04*

U.S. Cl. 310—9.6 **13 Claims**

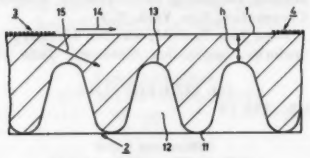
References Cited

UNITED STATES PATENTS

3,283,264	11/1966	Papadakis	310/9.6 X
3,353,120	11/1967	Tournois	333/30 R
3,435,381	3/1969	Tournois	333/30 R
3,458,831	7/1969	Veilex	310/9.8 X
3,464,033	8/1969	Tournois	333/30 R
3,573,673	4/1971	De Vries	333/30 R X
3,678,304	7/1972	Humphryes	310/9.8 X
3,887,887	6/1975	Wagers et al.	310/9.5 X

1. An acoustic surface-wave device comprising a body in the form of a wafer having a layer extending under a first major surface and made of a piezoelectric material, which first major surface serves as a propagation surface for the acoustic surface waves, a transducer coupled to said first major surface for converting an electric signal into a surface wave or conversely, and a plurality of discrete recesses being formed in and distributed over at least a portion of the second major surface of the wafer, which recesses extend into the wafer to a distance from the first major surface such that propagation

of the acoustic surface waves is substantially unaffected whereas propagation of bulk waves is significantly affected in an attenuating and/or scattering sense, the said recesses together with the surrounding intermediate areas being arranged in a configuration such that any straight line which joins any two edges of said second surface intersects at least one intermediate area.



B 502,289

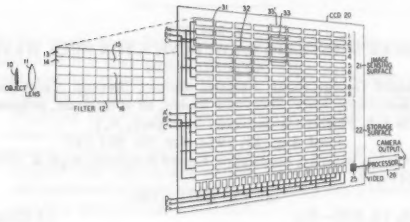
COLOR CODING FILTER FOR CHARGE-COUPLED-DEVICE CAMERA

Sooyoung Chai, Madison Township, Middlesex County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 3, 1974, Ser. No. 502,289
Int. Cl.² H04N 9/04, 3/16
U.S. Cl. 358—41 **21 Claims**

References Cited
UNITED STATES PATENTS

3,647,948	3/1972	Eto et al.	358/5
3,801,884	4/1974	Sequin	307/221
3,811,055	6/1974	Weimer	357/24



1. A color coding filter for use with an imaging device for converting light into electrical signals using a multiple-field format, the imaging device having a sensing surface being divided into an array of rectilinear resolution cells distinctive for each field, the cells defining a grid-pattern in each field and the cell boundaries in successive fields being displaced in at least one dimension to form overlapping grid patterns in the successive fields,

the filter comprising a plurality of rectilinear zones which are arranged in direct correspondence to the cell array of the sensing surface so that all light from a scene impinging on any cell of the sensing surface passes through a corresponding zone in the filter,

a plurality of discrete color areas being contained within each filter zone and being arranged so that the zone boundaries may be redefined with the change of cell boundaries during successive fields,

the transmissivity characteristic of each color filter area being selected to produce a desired color coding for each zone.

B 513,706

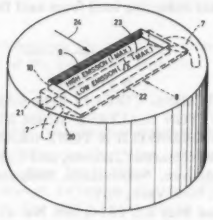
ROTARY-ANODE X-RAY TUBE

Wijbe Johannes Oosterkamp, Eindhoven, Netherlands, and Dieter Marschall, Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,706
Claims priority, application Netherlands, Oct. 15, 1973, 7314131
Int. Cl.² H01J 35/04
U.S. Cl. 313—60 **4 Claims**

References Cited
UNITED STATES PATENTS

3,801,846	4/1974	Haberrecker	313/60



1. An X-ray tube having a cathode for emitting an electron beam and a rotary anode to be irradiated in a focal spot by said electron beam, comprising means for producing a current density distribution, measured along a dimension x of said spot in the direction of rotation of the anode, that decreases from a maximum value at least substantially according to $1/\sqrt{x}$.

B 516,002

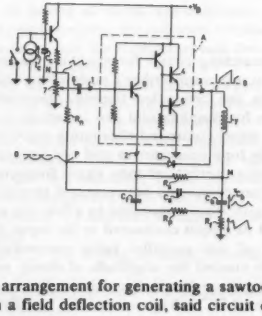
CIRCUIT ARRANGEMENT FOR GENERATING A FIELD DEFLECTION CURRENT

Antonius Hendrikus Hubertus Jozef Nillesen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 18, 1974, Ser. No. 516,002
Claims priority, application Netherlands, Oct. 31, 1973, 7314926
Int. Cl.² H01J 29/70, 29/72
U.S. Cl. 315—388 **6 Claims**

References Cited
UNITED STATES PATENTS

3,147,397	9/1964	Michaelson	315/387
3,515,933	6/1970	Myers	315/387
3,544,811	12/1970	McDonald et al.	315/388
3,553,478	1/1968	Steinbacher et al.	315/387



1. A circuit arrangement for generating a sawtooth deflection current in a field deflection coil, said circuit comprising

means for generating a sawtooth-shaped control signal; an amplifier having a first input terminal coupled to said generating means, a second input terminal, and an output means for coupling to said coil; low and high frequency feedback paths coupled to said second input terminal; a capacitor adapted to be coupled to said coil, whereby a parabolic voltage is developed thereacross; means for feeding back at least a portion of said parabolic voltage to said second terminal; and means for substantially eliminating overshoots and very low frequency oscillations in the mean value of said deflection current comprising an alternating current conducting field frequency clamping path means coupled between said output terminal and one of said input terminals for applying said parabolic voltage thereto.

B 523,696

RESILIENT CLAMPING MEMBERS FOR COLOR SELECTION ELECTRODE

Theodorus Cornelis Groot, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1974, Ser. No. 523,696

Claims priority, application Netherlands, Nov. 30, 1973, 7316388

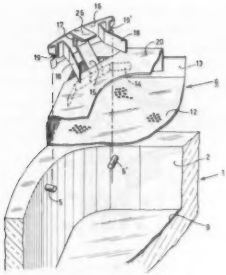
Int. Cl.² H01J *29/06, 29/02*

U.S. Cl. 313—404 **2 Claims**

References Cited

UNITED STATES PATENTS

2,939,981	6/1960	Hoagland	313/407
3,548,235	12/1970	Driedijk et al.	313/404



1. A color cathode ray tube including an evacuated envelope having a dish-shaped, substantially rectangular display screen and, within said envelope, a substantially rectangular color selection electrode disposed within and spaced apart from said screen, means for supporting said electrode comprising suspension members each connected at one end thereof to said electrode, elongate clamping members of resilient material each connected at its center to the free end of a corresponding suspension member and extending in a substantially transverse direction thereto, and pairs of metal supporting members sealed partly in the upright wall of said screen opposite the end portions of said clamping members and constituting two by two a clamping fit for each clamping member, said clamping members being adjusted for bearing upon and resiliently engaging the projecting ends of assigned pairs of said supporting members and abutting against the inner wall of said screen, each clamping member having at its free ends a notch which cooperates with the said supporting members.

B 527,669

SYSTEM FOR PROTECTION FROM LASER RADIATION

Peter D. Poulsen, Huntsville, Ala., assignor to General Dynamics Corporation, San Diego, Calif.

Division of Ser. No. 280,312, Aug. 14, 1972, Pat. No. 3,871,739. This application Nov. 27, 1974, Ser. No. 527,669

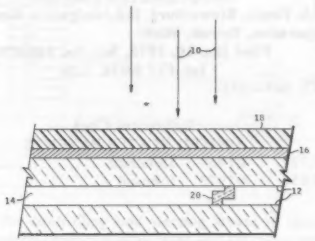
Int. Cl.² H01S *3/02*

U.S. Cl. 331—94.5 T **10 Claims**

References Cited

UNITED STATES PATENTS

3,301,624	1/1967	Morriss, Jr.	350/160 R
3,455,627	7/1969	Letter	350/160 R
3,734,592	5/1973	Sztankay et al.	350/160 R



1. A protective cover window for use with high energy infrared lasers which comprises:

a plate which is substantially transparent to infrared radiation, positioned in the path of radiation from an infrared laser, and

a coating on at least one surface of said plate, said coating comprises a fluorinated ethylene-propylene polymer which rapidly vaporizes without leaving a residue when subjected to intense infrared radiation,

whereby any surface contamination on said coating is carried away with the vaporizing material.

B 538,686

DIGITAL FREQUENCY SYNTHESIZER

Norman Green, Baltimore, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 6, 1975, Ser. No. 538,686

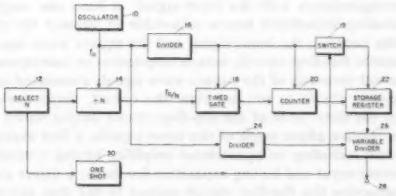
Int. Cl.² H03K *29/00*

U.S. Cl. 331—51 **10 Claims**

References Cited

UNITED STATES PATENTS

3,464,018	8/1969	Cliff	328/14



1. A digital frequency synthesizer comprising:

a source of a reference frequency signal;

a variable digital frequency divider means for dividing said reference frequency signal by a selected integer N;

a counter for accumulating a count related to the number of cycles of a frequency signal applied thereto;

gate means for applying, when open, the reference frequency as divided by said variable digital frequency divider means to said counter, said gate means being open for a predetermined time period;

programmable variable digital frequency divider means responsive to the count accumulated in said counter for setting the divisor thereof in proportion thereto and for dividing a frequency signal applied thereto by said divisor; and,

means for applying said reference frequency signal to said programmable variable digital frequency divider.

B 540,078

TORQUEMETER CIRCUIT

Keith A. Pieper, Brownsburg, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 10, 1975, Ser. No. 540,078

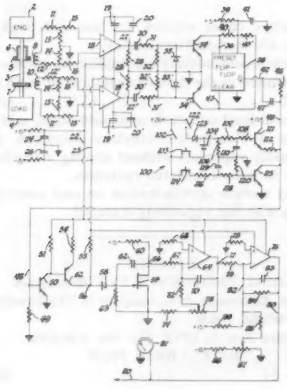
Int. Cl.² H03K *5/20*

U.S. Cl. 307—232 **4 Claims**

References Cited

UNITED STATES PATENTS

2,933,722	4/1960	Steinman	324/83 D
3,657,659	4/1972	Johnson	307/232



1. A relative phase angle measuring circuit comprising, in combination, means effective to receive two AC input signals of equal variable frequency and of variable relative phase angle; a high-gain amplifier responsive to each said input signal operative to generate a square wave signal in phase correspondence with the input signal, at least one amplifier including impedance means adjustable to balance the phase shifts between the input signal and the square wave signal; a bistable flip-flop circuit; means responsive to corresponding current reversals of the square wave signals connected to the flip-flop circuit to set and clear the circuit, respectively, so that the duty cycle of the flip-flop circuit output varies with the relative phase angle of the input signals; a first averaging circuit including an operational amplifier having a constant-current input and having capacitive feedback; a driver circuit connecting the flip-flop circuit output to the first averaging circuit input including an FET turned on and off in response to the output of the flip-flop circuit, the FET being connected to disable the constant-current input to the averaging circuit when turned on and to enable the constant-current input to the averaging circuit when turned off; a second averaging circuit responsive to the output of the first averaging circuit including an operational amplifier with capacitive feedback, the second averaging circuit providing an output emf varying linearly with relative phase angle of the input signals; first calibrating means including means effective to provide an input to the driver circuit indicative of zero input signal relative phase angle and means for adjusting the bias of the second averaging circuit; and second calibrating means including means effective to provide an input to the driver circuit indicative of a predetermined substantial input signal relative phase angle and means for adjusting the feedback of the first averaging circuit.

B 541,517

YOKE MOUNT ASSEMBLY

Bradford Knox Smith, Lititz, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 16, 1975, Ser. No. 541,517

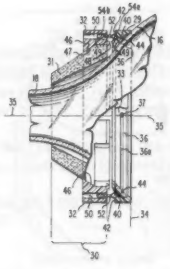
Int. Cl.² H01F *7/00*

U.S. Cl. 335—210 **10 Claims**

References Cited

UNITED STATES PATENTS

3,629,751	12/1971	Massa	335/212
3,633,137	1/1972	Thurnell	335/212
3,697,909	10/1972	Christensen et al.	335/210



1. A yoke mount assembly for a television picture tube of the type having a magnetic deflection yoke in operational relationship with the tube, a platform positioned on the external surface of the tube, and a yoke combination which includes a housing which encloses at least a portion of the yoke, wherein the improvement comprises:

a plurality of rigid members disposed between and connecting said yoke combination and said platform, said connecting members permitting adjustment of the position of said yoke combination with respect to said platform, said adjustment including rotational translation of said yoke combination with respect to said platform, each of said connecting members having a pair of end portions shaped such that substantially constant physical contact is maintained between one of said end portions of said connecting member and said yoke combination and the other of said end portions and said platform while said yoke position is adjusted.

B 544,961

FREQUENCY SCAN AND LOCK CIRCUIT FOR MOBILE RADIO CHANNEL SELECTION

Reed Edward Fisher, Parsippany-Troy Hills Township, Morris County, N.J., and Robert William Humes, Martinsville, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 29, 1975, Ser. No. 544,961

Int. Cl.[2] H04B *1/32*

U.S. Cl. 325—468 **5 Claims**

References Cited

UNITED STATES PATENTS

3,443,228	5/1969	Brenner et al.	325/56
3,532,988	10/1970	Magnuski	325/63

1. A mobile radio telecommunication unit having a tunable receiver and a circuit for ascertaining which one of predetermined receivable frequency channels is strongest, said circuit comprising

first and second analog signal sample and hold circuits,

controllable means for steering an output, which is indicative of received signal strength in one of said channels, of said receiver to one or the other of said sample and hold circuits,

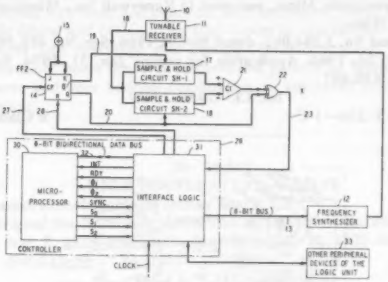
means for comparing outputs of said sample and hold circuits,

means, responsive to an output of said comparing means, for producing a signal pulse state when a new channel sample is the larger of two compared samples and a signal no-pulse state when the new sample is the smaller of the two compared samples, and

control means comprising

means for sequentially tuning said receiver to each of said channels,

means, responsive to said pulse state, for storing the name in said sequence of said channel having said large sample, and



means for controlling said steering means to steer each sequential channel sample from said receiving means to the one of said sample and hold circuits that held said smaller sample of two previously compared samples.

REISSUES

JANUARY 13, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

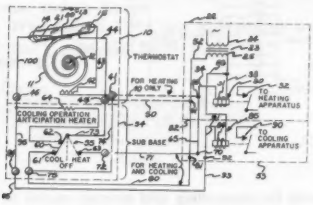
Re. 28,676
CONTROL APPARATUS

Walter E. Edelman, San Marcos, Calif., and David J. Sutton, Minneapolis, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Original No. 3,284,002, dated Nov. 8, 1966, Ser. No. 406,397, Oct. 26, 1964. Application for reissue Jan. 31, 1974, Ser. No. 438,487

Int. Cl.² G05D *23/30*

U.S. Cl. 236—1 C **6 Claims**



1. In a thermostat for controlling heating [and cooling] apparatus, *and being adaptable for controlling cooling apparatus by adding a subbase*, a main unit having a base, temperature responsive switch means mounted on said base, a first heater mounted *on said base* in thermal relation to said temperature responsive switch means, and connection means adapted to connect said heater and said switch means in a circuit for controlling the heating apparatus, a subbase unit having a second heater, *and* means for mounting said main unit on said subbase unit to thermally connect said second heater to said temperature responsive switch means and electrically connect said *first and* second [heater] *heaters* to said switch means and *adapted to connect* said switch means to control the *heating and the* cooling [apparatus.] *apparatuses.*

Re. 28,677
WASTE TREATMENT SYSTEM

Earl T. Blakley, Cincinnati; David E. Chupka, Middletown; David L. Harbron, Jr., Wisconsin Rapids; Paul G. Marsh, Hamilton, and Peter Seifert, Middletown, all of Ohio, assignors to Black Clawson Fibreclaim, Inc., Middletown, Ohio

Original No. 3,713,594, dated Jan. 30, 1973, Ser. No. 151,762, June 10, 1971. Division of Ser. No. 6,041, Jan. 26, 1970, Pat. No. 3,549,092 and Ser. No. 861,778, Sept. 28, 1969, Pat. No. 3,595,488. Application for reissue June 21, 1974, Ser. No. 481,882

Int. Cl.² B02C *13/16*

U.S. Cl. 241—46.08 **16 Claims**

1. A waste treatment system comprising:

a. a vessel *adapted to receive relatively frangible and infrangible material therein for treatment, said vessel* including an upstanding side wall portion,

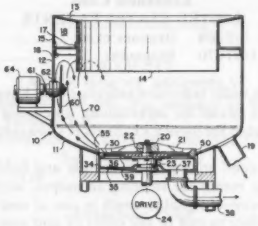
b. a rotor mounted in said vessel,

c. means defining a discontinuous attrition surface mounted in said vessel intermediate said side wall portion and said rotor,

d. said side wall portion being of appreciably greater extent in a direction parallel to the axis of rotation of said rotor than said attrition means,

e. said discontinuous attrition surface being spaced from said side wall portion to accommodate material flow through and over said attrition surface into [said space] *the space between said attrition surface and said side wall portion* and upwardly along said side wall in a vortical pattern,

f. flail means mounted on said rotor and projecting outwardly therefrom,



g. said flail means being mounted on said rotor for movement with respect thereto and engagement with said attrition means.

Re. 28,678
ELECTRIC EXPOSURE METER

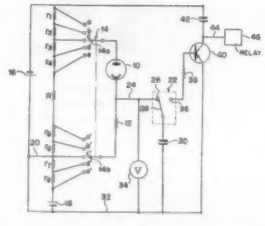
Akio Yanagi, Komae, and Shoichiro Kakuta, Tokyo, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Azuchi, Japan

Original No. 3,652,168, dated Mar. 28, 1972, Ser. No. 48,903, June 16, 1970. Continuation of Ser. No. 634,320, April 27, 1967, abandoned. Application for reissue Nov. 16, 1973, Ser. No. 416,705

Claims priority, application Japan, Apr. 29, 1966, 41-27268

Int. Cl.² G01J *1/46*

U.S. Cl. 356—215 **9 Claims**



8. An exposure measuring system comprising:

means including a voltage divider having a series connected network of a resistor and a photoconductive means, said photoconductive means being exposed to light, for producing a potential at the junction point of said resistor and photoconductive means, said potential varying relative to a predetermined point in a linear relation to the BV value of the brightness of the light incident on said photoconductive means;

means including a variable resistor device having a resistor portion connected in parallel with said series connected network and adjustable in accordance with a light unrelated photographing parameter in a manner to vary the potentials at both end terminals of said voltage divider equally and in the same direction and vary said potential at the said junction point with changes in said last mentioned potential for each increment of adjustment of said parameter corre-

sponding to changes of potential effected by unit changes in the brightness of said incident light; and storage means connectable with said means for producing a potential for storing said potential in said storage means.

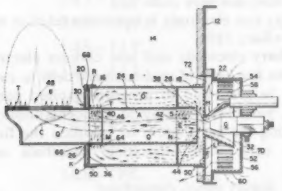
Re. 28,679
BURNERS

Edgar Clarence Robinson, North Vancouver, Canada, assignor to International Industries Ltd., Burnaby, Canada

Original No. 3,620,657, dated Nov. 16, 1971, Ser. No. 36,987, May 13, 1970. Application for reissue Nov. 16, 1972, Ser. No. 307,199

Int. Cl.² F23L *7/00*

U.S. Cl. 431—9 **34 Claims**



1. In the art of combusting flammable fluid fuel for creating heated gas, the method steps which are characterized by:

i. initially projecting a relatively long tongue of ignited fuel longitudinally from a source to a principal burning zone remote from said source,

ii. causing an opposite, counterflow of a part of said tongue back towards said source, the originating location of said counterflow being between said source and said principal burning zone,

iii. reintroducing said counterflow back into said tongue near said source,

iv. causing the flame of said tongue to be extinguished when a sufficient rise in ambient temperature has supervened, and substantially simultaneously therewith

v. causing the generation of a blue flame at the said originating location of counterflow, and at said principal burning zone, and

vi. introducing sufficient air to [meet the requirements aforesaid, said burning zone being further from said source than said original location of counterflow.] *said burner to support combustion.*

Re. 28,680
APERTURED NONWOVEN FABRICS AND METHODS OF MAKING THE SAME

Carlyle Harmon, Provo, Utah, assignor to Johnson & Johnson, New Brunswick, N.J.

Original No. 3,741,724, dated June 26, 1973, Ser. No. 104,174, Jan. 5, 1971. Application for reissue June 12, 1974, Ser. No. 478,664

Int. Cl.² B29C *23/00;* **D04H** *11/00*

U.S. Cl. 8—115.5 **3 Claims**

1. A method of making an apertured nonwoven textile fabric having a predetermined pattern of fabric apertures and fiber bundles created by applied fluid forces which comprises: (1) chemically treating and modifying heat-sensitive water-soluble polyvinyl alcohol fibers by (a) a heat treatment in the range of from about 200° C. to about 250° C. to raise their wet softening temperature whereby they are essentially wet heat-insensitive up to a temperature [of at least about 150° C.] *in the range of from about 60° C. to about 100° C.* and by (b) insolubilizing or cross-linking treatment with an aldehyde to give them an average degree of acetalization of from about 20 mol percent to about 35 mol percent and a moisture regain at 40°C. and a relative humidity of 90% down to about 10% but not to as low as 7½% whereby they develop the necessary balance of hydrophobic-hydrophilic properties and are sufficiently heat-insensitive and water-insoluble *as not to dissolve in hot water at a temperature of about 110°* C. and as to be capable of controlled movement and manipulation by applied fluid forces; (2) crimping said relatively heat-insensitive, water-insoluble polyvinyl alcohol fibers so that they possess from about six to about 16 crimps per inch; (3) forming a cohesive fibrous web from said crimped, heat-insensitive, water-insoluble fibers; and (4) applying fluid forces to said fibrous web to move and rearrange said crimped, heat-insensitive, water-insoluble fibers into a predetermined pattern of fabric apertures and fiber bundles constituting an apertured nonwoven fabric.

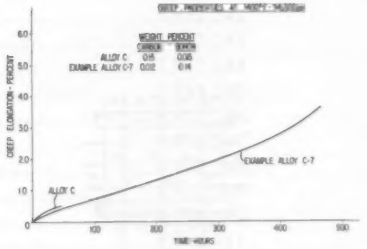
Re. 28,681
HIGH TEMPERATURE ALLOYS

James French Baldwin, Delray Beach, Fla.

Original No. 3,869,284, dated Mar. 4, 1975, Ser. No. 346,815, Apr. 2, 1973. Application for reissue July 29, 1975, Ser. No. 598,111

Int. Cl.² C22C *19/05*

U.S. Cl. 75—134 F **57 Claims**



50. A nickel base alloy for use at relatively high temperatures consisting essentially of the following elements in the weight percent ranges set forth:

ELEMENTS	PERCENT
Chromium	5–22
Aluminum	0.2–8
Titanium	0.5–7
Boron	0.05–0.3
Carbon	less than 0.05
Cobalt	2–17
Columbium	0.00–3
Molybdenum	0.00–8
Tantalum	0.00–10
Vanadium	0.00–2
Tungsten	0.00–20
Rhenium	0.00–2
Zirconium	0.00–1.00

the balance of the alloy being essentially nickel and minor amounts of impurities and incidental elements which do not detrimentally affect the basic characteristics of the alloy, said nickel being present in an amount of from about 35% to 85% by weight.

Re. 28,682
DECORATIVE LAMINATE

Charles E. Hoey, Marlton, N.J., assignor to Rohm & Haas Company, Philadelphia, Pa.

Original No. 3,804,700, dated Apr. 16, 1974, Ser. No. 255,879, May 10, 1972. Application for reissue June 9, 1975, Ser. No. 585,154

Int. Cl.[2] B32B *3/26*

U.S. Cl. 428—196 **4 Claims**

1. A laminate consisting of

a. a transparent plastic surface film of a thermoset emulsion polymer *transferred from a release surface and* adhered to

b. a crushed, crosslinked thermoset resilient foam of a thermoset emulsion polymer adhered to

c. a textile fabric substrate, with

d. a decorative layer between (a) and (b) the crushed foam layer (b) being self-bonded to the substrate (c) and the surface film.

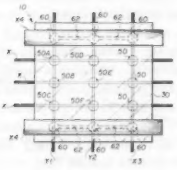
Re. 28,683
GASEOUS DISCHARGE DISPLAY PANEL WITH AUXILIARY EXCITATION CELLS

George A. Kupsky, State College, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Original No. 3,644,925, dated Feb. 22, 1972, Ser. No. 791,208, Jan. 7, 1969. Application for reissue Feb. 15, 1974, Ser. No. 443,067

Int. Cl.[2] H01J *17/30*

U.S. Cl. 340—378 R **32 Claims**



1. A flat panel display device comprising

a gas-filled envelope including an insulating center plate and top and bottom insulating plates all sealed together vacuumtight along their adjacent peripheries,

said center plate comprising a solid sheet having a plurality of discrete apertures, each forming a gaseous display cell, said cells being arrayed in rows and columns,

the walls of said display cells being free of material which can generate excited particles and in the same physical state as other portions of the surface of said center plate,

a row electrode aligned with each row of display cells and a column electrode aligned with each column of display cells,

said display cells being adapted to be fired by the application of operating potentials to selected ones of said row and column electrodes,

conductive means attached to said column electrodes for scanning said display cells one column after the next, while potentials are selectively applied to said row electrodes,

a plurality of auxiliary discrete gas-filled cells adapted to glow at a low level, not for viewing, but to provide excited particles for firing said [first] *display* cells,

the walls of said auxiliary cells being free of material which can generate excited particles and in the same physical state as other portions of the surface of said center plate,

each auxiliary cell being aligned with and in operative relation with a column of said [first] *display* cells, each column electrode also being in operative relation with one of said auxiliary cells, and

an auxiliary row electrode in operative relation with each of said auxiliary cells,

said auxiliary electrode and said column electrodes being usable to fire each of said auxiliary cells to cause the gas therein to glow and to generate excited particles, said excited particles diffusing to adjacent display cells and energizing the gas therein to facilitate the firing of said display cells when operating potentials are applied thereto.

12. A flat display panel, comprising

a gas-filled envelope including a face plate and a base plate closely spaced to one another and hermetically sealed together along a predetermined perimeter,

a plurality of groups of localized glow discharge regions, said groups being disposed side-by-side along a common plane within said envelope and each region being capable of sustaining a glow discharge which is visible through said face plate,

at least first and second electrodes adjacent each such visible glow discharge region, said electrodes being selectively energizable to initiate glow discharges in selective ones of said regions, and

a plurality of auxiliary glow discharge regions disposed in succession coplanar with said visible glow discharge regions but hidden from view through said face plate, each being adjacent and associated with one of said groups of visible glow regions to supply excited particles to the visible glow regions of the group and facilitate the initiation of glow discharge therein

at least two electrodes adjacent each of said auxiliary glow discharge regions to initiate glow discharges in said auxiliary regions,

means for sequentially energizing the electrodes of said auxiliary glow regions from the first in the succession to the last, for supplying excited particles sequentially to said visible glow region groups, and

means for energizing said groups of visible glow regions sequentially, one such group after another, in synchronism with the energization of said auxiliary glow discharge regions, to initiate glow in selective ones of the visible glow regions in each such group.

PATENTS

GRANTED JANUARY 13, 1976

ERRATA

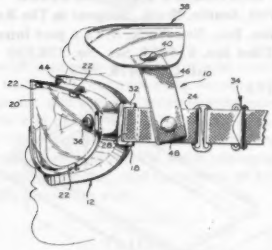
For CLASS	See PATENT NO.
126-041 R	3,931,805
126-400	3,931,806
241-296	3,931,900
260-309.5	3,932,176
148-112	3,932,234
148-113	3,932,235
148-113	3,932,236
148-113	3,932,237
148-131	3,932,238
148-186	3,932,239
149-019.2	3,932,240
149-019.3	3,932,241
149-019.9	3,932,242
156-020	3,932,243
156-071	3,932,244
156-079	3,932,245
156-089	3,932,246
156-148	3,932,247
156-210	3,932,248
156-213	3,932,249
156-213	3,932,250
156-245	3,932,251
156-245	3,932,252
156-249	3,932,253
156-361	3,932,254
156-401	3,932,255
156-417	3,932,256
156-497	3,932,257
156-498	3,932,258
156-510	3,932,259
156-583	3,932,260
209-309	3,932,442
428-296	3,932,682
424-346	3,932,684
191-012 R	3,932,714
323-102	3,932,808
240-041.6	3,932,837
444-001	3,932,885

PATENTS

GRANTED JANUARY 13, 1976

GENERAL AND MECHANICAL

3,931,646
DOUBLE LENS GOGGLE
Larry Gordon Loughner, Andover, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed June 26, 1974, Ser. No. 483,206
Int. Cl.[2] A61F *9/02*
U.S. Cl. 2—14 V **5 Claims**



1. In a goggle system including a facepiece having a forwardly disposed main goggle lens and an elastic headband connected to opposite sides of said facepiece for supporting the whole goggle system upon the head of a wearer, the improvement of an auxiliary lens adapted to be used forwardly of said main goggle lens in combination with attachment means therefor comprising:

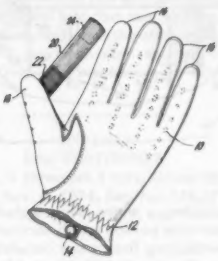
a pair of elastic straps, one end of each strap being attached to said auxiliary lens adjacent one of each of its opposite sides;

pivotable fastening means connecting the opposite ends of said straps directly to said headband at points one adjacent to each of said opposite sides of said facepiece; and

said elastic straps being compliant with stretching and retraction of said elastic headband whereby interference with the function of said headband is avoided and said straps further being independently stretchable whereby said auxiliary lens is permitted to be selectively moved forwardly of said main goggle lens and swung about said pivotable fastening means from a position of use forwardly of said main lens to positions of storage above and below said facepiece all without disconnection from said elastic headband.

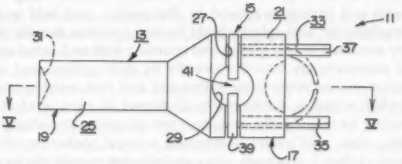
3,931,647
GOLF GLOVE IMPROVEMENT
Sam Dien, 156 Rockwood Place, Englewood, N.J. 07631
Filed Apr. 3, 1975, Ser. No. 564,667
Int. Cl.[2] A11D *19/00*
U.S. Cl. 2—161 A **3 Claims**

1. In a golf glove of conventional design, the improvement comprising an elongated webbing fixedly attached at one end to the thumb-stall substantially perpendicular thereto, said webbing including variable mating means at the opposite ends and sides thereof, wherein said webbing may be wrapped



circumferentially about the thumb-stall to a degree of snugness suitable to the user.

3,931,648
STAPEDIAL PROSTHESIS
John J. Shea, Jr., Memphis, Tenn., assignor to Richards Manufacturing Company, Memphis, Tenn.
Filed Jan. 8, 1975, Ser. No. 539,509
Int. Cl.[2] A61F *1/24, 1/18*
U.S. Cl. 3—1.9 **9 Claims**



1. A prosthesis for replacing the stapes of the middle ear, said prosthesis comprising:

a. piston means for transmitting sound vibrations from the incus to the oval window of the middle ear, said piston means including a first end for engagement with the incus and including a second end for association with the oval window, said first end of said piston means including a socket for receiving a portion of the incus;

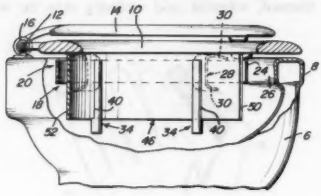
b. anchor means securely attached to said first end of said piston means for anchoring said piston means to the incus, said anchor means including a clamp member for extending substantially around the incus to fixedly attach said piston means to the incus, said clamp member being capable of being easily bent to securely grasp the incus and being capable of maintaining that bent shape after the force causing it to be bent is removed, said clamp member including a first clasp portion for extending around a first section of the long process of the incus and a second clasp portion for extending around a second section of the long process of the incus, said first and second clasp portions being movable by force between a first position substantially away from each other for allowing said clamp member to be inserted around the long process of the incus by way of the space between said first and second clasp portions and a second position substantially adjacent each other for causing said clamp member to securely grasp the long process of the incus.

3,931,649

TOILET ANTI-SPLASH GUARD

Ollie F. Jankowski, 17738 W. Rogers Drive, New Berlin, Wis. 53151

Filed Nov. 30, 1973, Ser. No. 420,687
Int. Cl.² A47K 17/02
U.S. Cl. 4—1 4 Claims



1. In combination, a water closet including a toilet bowl having an upper open portion wholly surrounded by a conventional-type overhanging flush water circulating and distributing rim, a hingedly mounted liftable and lowerable seat ring positionable atop said rim, and a hingedly mounted lid-type cover for said seat ring, adapter means mounted on said rim, and an anti-splash guard carried by said adapter means and interposed between said rim and seat ring, said adapter means being relatively stationary and including resilient means contacting the guard for permitting retraction of the guard, said guard being vertically projectable and retractable and automatically projected to an upstanding anti-splash position by the resilient means when the seat ring and companion cover are elevated and being adapted to retract to a down out-of-the-way position when the seat ring is lowered to an in-use position atop said flush rim, said adapter means including fixedly mounted guides, and the resident means being tensioned coil springs arranged in the guides, and said guard comprising an anti-splash shield having portions therein slidingly mounted in said guides and coacting with and acted upon and automatically biased upwardly by said springs, and said adapter means comprising a first soil and rust resisting strap member which is substantially C-shaped in plan, said strap member having rigidly mounted rim gripping and clamping spring clips, said guides comprising vertical socket members closed at their lower ends, open at their upper ends, the upper half-portion of each socket member having guide slots in which a lower edge portion of said guard is retentively but slidingly keyed, and the lower socket portion of each socket member having one of said tensioned coil springs housed therein and operatively engaging the coordinating portion of said guard.

3,931,650

DISPOSAL DEVICE FOR WHEELCHAIRS

Kent A. Miller, 7775 La Costa Circle, Buena Park, Calif. 90620

Continuation-in-part of Ser. No. 382,580, July 25, 1973, abandoned. This application Mar. 24, 1975, Ser. No. 561,258
Int. Cl.² A47K 11/02, 7/02
U.S. Cl. 4—134 6 Claims

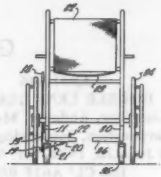
1. Apparatus for controlling the disposal of urinary waste from a collection receptacle carried by a wheelchair occupant, said receptacle including a drain tube, comprising:

a valve rigidly connected to said wheelchair and selectively positionable to an open or closed configuration;

an inlet conduit for said valve connected to said drain tube;

an outlet conduit for said valve, said outlet conduit extending from said valve to a location beneath said wheelchair; and

means connected to said valve and extending to a position remote from said valve and proximate said occupant for selectively positioning said valve to said open configuration to permit flow of said waste from said receptacle,



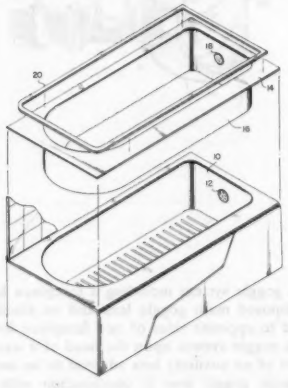
through said valve and outlet conduit, onto the floor beneath said wheelchair.

3,931,651

DISPOSABLE BATHTUB LINER

Francis X. Weir, Seattle, Wash., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 6, 1975, Ser. No. 538,550
Int. Cl.² A47K 3/00
U.S. Cl. 4—173 2 Claims



1. In combination with a magnetic bathtub, a thin flexible plastic liner having a horizontal flange overlying the top surface to the bathtub and having a central oval opening with a vertical peripheral wall extending downward and overlying the inner wall surface of the bathtub, the bottom of the bathtub being exposed, the inner wall surface of the bathtub having an overflow outlet, the wall of the liner having a slotted opening overlying the outlet, and means with form of a flat magnet overlying said flange to detachably secure the flange to the top surface of the bathtub.

3,931,652

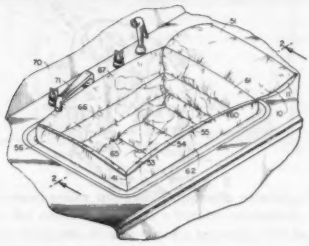
INFANT BATHING APPARATUS

Barry A. Navarra, c/o Port-O-Tub Inc., 214 Old Nyack Turnpike, Spring Valley, N.Y. 10977

Filed Mar. 20, 1975, Ser. No. 560,167
Int. Cl.² A47K 3/064, 3/06
U.S. Cl. 4—177 2 Claims

1. Baby bathing apparatus for use with a standard kitchen sink comprising, in combination, upper and lower layers of flexible material, cruciform shapes cut from said upper and lower layers of material with said cruciform shapes each having a bottom portion and sides and ends extending therefrom, extensions from one end of each cruciform shape, peripheral welds joining the peripheries of said cruciform shapes, transverse spaced apart line welds joining said layers together

within said bottom portions and said ends of said cruciform shapes, longitudinal spaced apart line welds joining said layers together within said sides of said cruciform shapes, said line welds terminating short of the peripheries of said cruciform shapes, a mouth inflation valve in one of said extensions, said valve inflating said apparatus with said bottom portions inflating as contiguous transverse ribs forming the bottom of said

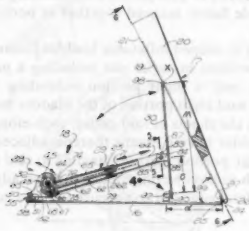


apparatus, with said sides and ends of said cruciform shapes inflating as horizontal contiguous ribs forming sides and ends of said apparatus, and with said extensions inflating as a pillow resting at the end of the sink, said bottom of said apparatus having one end opposite said pillow containing a drain, a stopper for said drain, and vertical welds joining adjacent sides and ends of said apparatus, said uppermost of said horizontal ribs extending above the sink.

3,931,653
POWER OPERATED BACK REST

Jack M. Bien, 356 1/2 N. Ogden Drive, Los Angeles, Calif. 90036

Filed Sept. 30, 1974, Ser. No. 510,381
Int. Cl.² A47C *21/00*; A61G *7/06*
U.S. Cl. 5—327 B **7 Claims**



1. An adjustable body rest assembly comprising:

a base adapted to be placed on and be supported by an upwardly facing surface of a bed or other support structure with said base in generally horizontally extending condition;

a back rest hinged to said base for pivotal movement about a first essentially horizontal axis through different inclined positions and forming a variable acute dihedral angle with said base;

an extensible screw and nut mechanism located above said base and within said dihedral angle and including a screw part and a threaded interengaged nut part one of which is actuable along a second axis relative to the other to lengthen said mechanism in response to relative rotation of the parts about said second axis;

said two parts exerting force in generally opposite directions against said base and said back rest at locations offset from said first axis to swing said back rest between said different inclined positions;

a rotary motor located above said base and within said dihedral angle and connected to said screw and nut mechanism and operable to drive one of said screw and nut parts rotatively relative to the other in a relation actuating said back rest between said different inclined positions;

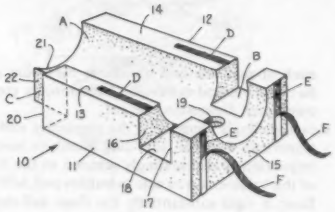
a first pivotal connection attaching both said motor and said screw and nut mechanism at one end of the latter to said base for upward and downward swinging movement of both the motor and the screw and nut mechanism in unison within essentially a vertical plane disposed essentially transversely of said first axis and during actuation of said back rest about said first axis; and

a second pivotal connection at the other end of said extensible screw and nut mechanism through which force is transmitted from said mechanism to the back rest to actuate it.

3,931,654
LEG POSITIONER

Donald C. Spann, 5 Ferncreek Court, Greenville, S.C. 29607

Filed Nov. 4, 1974, Ser. No. 520,371
Int. Cl.² A47C *21/00*
U.S. Cl. 5—327 **3 Claims**



1. A device for supporting the lower thigh, leg and foot of a patient when lying on the side during prolonged periods of bed rest comprising:

a. an elongated base;

b. a plurality of sides extending upwardly from said base;

c. an open groove interposed between said sides extending the entire length of said base;

d. a pair of transverse surfaces in said sides adjacent one end of said base defining a transverse slot extending across said groove and said sides adjacent said one end thereof for receiving a foot of the patient when lying on the side; and

e. pressure sensitive fastening means carried by a top surface extending between respective sides and said slot and by a vertical surface of said one end extending across said slot for adjustably closing said slot to position said foot supported therein;

whereby the patient may be properly positioned on a side with a knee bent, the lower portion of the leg cradled in said groove, and the foot tilted and positioned as desired in the slot by fastening the pressure sensitive fastening means in a desired position.

3,931,655
INFLATABLE BOAT

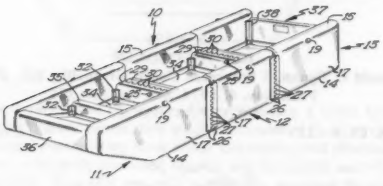
Terry L. Luscombe, Armstrong, Iowa 50514

Filed Jan. 21, 1974, Ser. No. 435,301
Int. Cl.² B63B *7/08*
U.S. Cl. 9—2 A **1 Claim**

1. An inflatable boat comprising:

opposed substantially parallel elongate upright inflated side members, a plurality of similar longitudinally spaced apart elongate inflatable transverse members extending between and engaging said side members, one of said transverse members extending between said side mem-

bers adjacent the front end thereof, said transverse members having a vertical dimension substantially less than the vertical dimension of said side members, each of said side and transverse members being formed of a flexible and impervious material and when inflated, being of substantially rectangular cross-sectional configuration and including opposed, substantially parallel vertical side wall elements, opposed end wall elements, top wall elements and a lower wall element, a plurality of fibers extending between and being bonded to the inner surface area of the vertical wall elements of each side and transverse member, each side and transverse member having a valve therein to permit inflation and deflation thereof,



each of said side and transverse members when inflated having a vertical dimension substantially greater than the transverse dimension thereof,

means sealingly connecting the respective end portions of a transverse member, said side members having a flexible impervious panel sealingly secured to the lower portions of the transverse and side members and defining a flexible floor, a rigid substantially flat floor defining panel positioned upon said flexible floor panel and extending between said side members,

and a rigid, vertical transom extending between and sealingly secured to the side members and flexible floor member adjacent the rear ends thereof.

3,931,656

SURFBOARD LEASH

Derek Vincent Thomson, Escalls Cliff, Sennen, Cornwall, England

Filed June 13, 1974, Ser. No. 479,062

Int. Cl.² A63C *15/06*

U.S. Cl. 9—310 E **11 Claims**

1. A leash for attaching a surfboard to a surfer, comprising:

an outer tubular casing of resilient material,

at least one separate reinforcement element housed within said outer tubular casing and attached at each end thereto, said reinforcement element itself being resilient, the natural length of said inner reinforcement element being greater than the natural length of said outer tubular casing, and the maximum extended length of said reinforcement element being less than the maximum extended length of said outer tubular casing,

first attachment means on one end of said reinforcement element for attaching it to a part of the body of a person, and

second attachment means at the other end of said reinforcement element for attaching it to a surfboard.

3,931,657

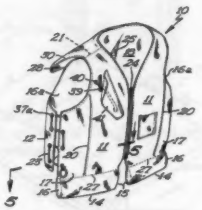
LIFE VEST

Walter C. Jones, Armstrong, Iowa, assignor to Rubber Dynamics Corporation, Armstrong, Iowa

Filed June 12, 1974, Ser. No. 478,740

Int. Cl.² B63C *9/10, 9/16*

U.S. Cl. 9—342 **5 Claims**



1. A personal flotation vest device comprising:

a pair of front panels and a pair of rear panels, each panel having inner and outer longitudinal edges, upper and lower edges, means securing the respective upper edges and portions of the outer longitudinal edges of a front panel and back panel together to define an armhole therebetween, means securing the inner longitudinal edges of the back panels together, and releasable closure means for releasably securing the inner longitudinal edges of the front panels together,

each panel including a flexible fabric liner covering the interior surface thereof and a flexible cover covering the exterior surface thereof and secured at its periphery to the periphery of the associated fabric liner,

each panel including a vertically extending sheet of buoyant material extending from adjacent the lower edge of each panel to a point adjacent the upper edge thereof and interposed between the associated liner and cover,

a collar secured to said panels and including a pair of sheets of flexible fabric secured together at peripheral portions thereof,

a generally U-shaped inflatable bladder formed of an elastic gas impervious material and including a pair of elongate sections and a bight portion extending between such sections said bight portion of the bladder being positioned between the sheets of said collar, each elongate section of said bladder having means thereon adjacent one longitudinal edge portion thereof attached to said closure means, and each section having means thereon adjacent its other longitudinal edge portion secured to said cover and liner.

3,931,658

WASHING APPARATUS FOR VEHICLES

Lyle B. Evans, 3520 SW. 108th Ave., Beaverton, Oreg. 97005

Continuation-in-part of Ser. No. 475,103, May 31, 1974, abandoned, which is a continuation-in-part of Ser. No. 386,976, Aug. 9, 1973, abandoned. This application Nov. 11, 1974, Ser. No. 522,935

Int. Cl.² B60S *3/06*

U.S. Cl. 15—4 **25 Claims**

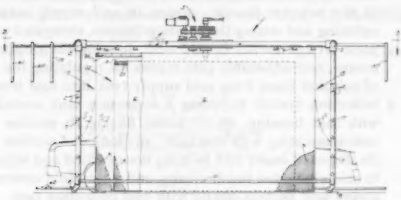
1. An apparatus for use in the washing of vehicles and the like, said apparatus comprising,

a support structure,

a drive mechanism including a prime mover on said support structure,

curtain assemblies supported by said structure with each assembly including a circular curtain support adapted for independent rotational movement about a common axis and from which are suspended curtains of strip-like elements, said strip-like elements of each curtain assembly being in radial spaced relationship to those of the other assembly when the curtain assemblies are at rest, said

strip-like elements of one curtain assembly being interengageable with strip-like elements of another curtain assembly upon their displacement resulting from automobile contact, and



said drive mechanism imparting opposite rotational movement to the curtain supports whereby oppositely moving strip-like elements of each curtain assembly will be trailed across the automobile body in opposite directions with said strip-like elements of the different curtain assemblies randomly engaging each other as they pass in opposite directions to enhance cleaning action of the strips.

3,931,659

FLOOR TREATING MACHINE

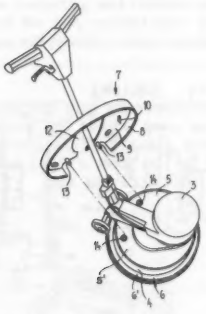
Kurt Pfefferkorn, Wallisellen, Zurich, and Charles Sérou, Opfikon-Glattbrugg, Zurich both of Switzerland, assignors to Diethelm AG, Zurich, Switzerland

Filed June 24, 1974, Ser. No. 482,096

Claims priority, application Austria, June 28, 1973, 5705/73

Int. Cl.² A47L *11/162*

U.S. Cl. 15—49 R **7 Claims**



1. A floor treating machine capable of being supported at the floor to be treated by means of a work disk, said work disk being arranged adjacent a substantially ring-shaped stop, the improvement comprising: said machine possessing a machine housing, said machine being provided with two work disks of different diameter which are selectively insertable at least partially into the machine housing, one of said work disks defining a smaller diameter work disk and the other of said work disks defining a larger diameter work disk, a separate substantially ring-shaped stop provided for each such different diameter work disk, the ring-shaped stop provided for the smaller diameter work disk defining a smaller ring-shaped stop relative to the other ring-shaped stop provided for the larger diameter work disk defining a larger ring-shaped stop, and at least the ring-shaped stop provided for the smaller diameter work disk being fixedly secured to said machine housing.

3,931,660

SCRUBBING APPARATUS FOR VEHICLE-WASHING STATION

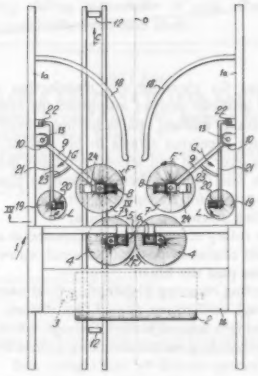
Uberto Capra, Alte Ceccato (Vicenza), Italy

Filed Oct. 2, 1974, Ser. No. 511,183

Claims priority, application Italy, Oct. 3, 1973, 29664/73; Jan. 11, 1974, 19305/74; Feb. 8, 1974, 20339/74

Int. Cl.² B60S *3/06*

U.S. Cl. 15—53 AB **10 Claims**



1. A scrubbing apparatus for a vehicle-washing station, comprising:

a guide structure straddling a path for a wheeled vehicle movable relatively thereto along a straight line;

horizontal rotary brush means mounted on said structure above said path for up-and-down movement to scrub front, top and rear surfaces of said vehicle;

a pair of first vertical rotary brushes symmetrically mounted on said structure for oscillatory movement in a first transverse plane perpendicular to said line to scrub front, side and rear surfaces of respective halves of said vehicle;

a pair of horizontally swingable supporting arms symmetrically fulcrumed on said structure above said path with pivotal axes located in a second transverse plane perpendicular to said line downstream of said first transverse plane with reference to the apparent vehicular motion and with free ends extending inwardly from said pivotal axes toward the centerline of said path;

a pair of second vertical rotary brushes suspended from said free ends for supplementing the scrubbing action of said first vertical brushes; and

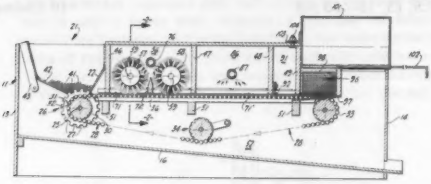
biasing means urging said supporting arms into a normal position in which said second vertical brushes lie upstream of said second transverse plane and are separated from each other by a distance less than the width of said horizontal brush means, said biasing means being sufficiently yieldable to enable said second vertical brushes to move under the thrust of the oncoming vehicle past said second transverse plane into an alternate position in which they are again separated after closely approaching each other in an intermediate position coinciding with said second transverse plane.

3,931,661

APPARATUS FOR CLEANING AND DISINFECTING INSEMINATION STRAWS

Albertus G. Horsting, and Samuel Luzaich, both of Santa Rosa, Calif., assignors to Tur-Colossus, Inc., Santa Rosa, Calif.

Filed Aug. 8, 1974, Ser. No. 495,585
Int. Cl.[2] A46B 13/02
U.S. Cl. 15—308 7 Claims



1. Apparatus for cleaning and disinfecting small straws employed for artificial poultry inseminations comprising

a pair of parallel endless chains having spaced depressions thereon for receiving straws to be carried thereby and extending over first and second rotatably mounted cylinders with one cylinder being driven to thus move said chains together for transporting straws,

means holding straws on said chains,

at least one rotary mounted brush disposed at a first station above said chains in position to scrub straws carried by said chains past the brush,

means directing cleaning disinfecting fluid onto said straws and through said straws at said first station,

means defining a second station through which said chains pass and including means directing a rinse fluid onto and through straws carried by said chains, and

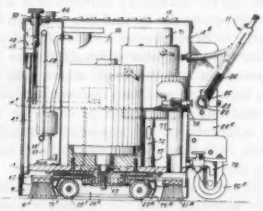
straw drying means directing a jet of air through rinsed straws on said chains and directing air onto the exterior of said straws.

3,931,662

FLOOR CLEANING MACHINE WITH VACUUM PICKUP

James E. Nayfa, 5015 Sharp St., Dallas, Tex. 75247, and Andrew D. Stanley, 2306 Cedar Way Drive, Dallas, Tex. 75241

Division of Ser. No. 147,866, May 28, 1971, Pat. No. 3,761,987. This application Aug. 20, 1973, Ser. No. 390,023
Int. Cl.[2] A47L 7/00
U.S. Cl. 15—320 8 Claims



7. A machine for treating floor surfaces comprising

a housing having front and rear ends in relation to normal movement over a floor surface in one direction, and having a generally horizontal floor;

means mounted on said housing for supporting said housing for movement along the floor surface;

supply means in said housing for supplying a cleaning medium, including dispensing means disposed at the front end thereof; brush means mounted under said housing behind and adjacent to said dispensing means; power means in said housing for producing movement of said brush means in said floor plane relative to said housing;

said cleaning medium supply means including a sealed supply tank in said housing for containing a liquid solution, a source of compressed air communicating with said tank for pressurizing said tank and for producing a foam of the solution therein, means in said supply tank for agitating and mixing the solution therein, elongated transverse trough means in said tank defining the dispensing means, and adjustable gate means for regulating the flow of solution foam from said supply tank into said trough;

a collection system including a collection tank associated with said housing, an air pump having its suction side communicating with said tank, an elongated suction nozzle disposed under said housing floor behind and adjacent to said elongated brush means, and a manifold communicating said suction nozzle with said collection tank.

8. A machine as set forth in claim 7

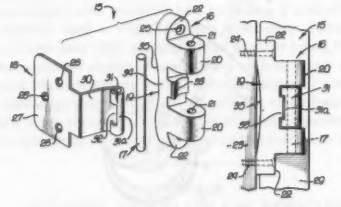
said elongated transverse trough means being disposed in the upper portion of said supply tank; a plurality of vertical conduits defining said dispensing means for directing foam from said trough means to the floor surface at the front of said housing; and said adjustable gate means comprising an adjustable weir gate for controlling the flow of solution foam from the main supply tank chamber into said trough.

3,931,663

SPRINGLESS SELF-LATCHING HINGE HAVING A RESILIENT HINGE MEMBER

Frank A. Holmes, Buena Park, and Benjamin H. Stansbury, Jr., Beverly Hills, both of Calif., assignors to Jaybee Manufacturing Corporation, Los Angeles, Calif.

Continuation of Ser. No. 296,938, Oct. 12, 1972, abandoned. This application Dec. 6, 1974, Ser. No. 530,192
Int. Cl.[2] E05D 11/08
U.S. Cl. 16—142 12 Claims



1. In a self-latching hinge structure for a cabinet:

a. a pair of hinge members connected together for angular movement about a hinge axis;

b. means determining a limited closed position of said hinge members;

c. one of said hinge members being made of relatively flexible, resilient molded plastic material;

d. means relatively rigidly securing spaced portions of said one hinge member to a relatively rigid cabinet to limit flexure between said spaced portions;

e. said hinge members having interacting parts developing stress in said one hinge member as a function of angular movement therebetween, said parts being positioned to maximize said stress just prior to arrival of said hinge members at said closed position;

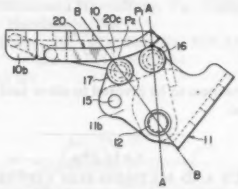
f. said stress acting in a direction to impose a stress on said cabinet at said securing means.

3,931,664

DOOR HINGE UNIT

Ryuzo Nakano, Aichi; Ryoichi Fukumoto, Nagoya, and Kenichi Fukura, Chiryu, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Asahi, Japan

Filed Aug. 11, 1972, Ser. No. 279,893
Claims priority, application Japan, Aug. 11, 1971, 46-60918
Int. Cl.² E05D 11/10
U.S. Cl. 16—145 1 Claim



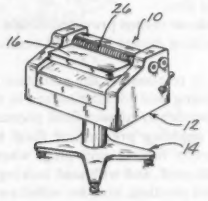
1. A door hinge unit comprising a first base plate adapted to be mounted on a supporting structure, a second base plate adapted to be mounted on a door, vertically extending hinge pin means pivotedly connecting base plates together, a pair of rollers mounted for rotation about parallel vertically disposed axes on one of said base plates, and resilient means mounted on the other of said base plates, said resilient means having a horizontally extending portion disposed in constant pressure contact with at least of one of said rollers at all times and a vertically extending portion supported by the other of said base plates under torsional stress so as to provide a rotational moment acting between said base plates, both of said rollers being disposed on the same side of said horizontally extending portion and in contact therewith at an intermediate door opening position to eliminate said rotational moment, only one of said rollers contacting said resilient means as the door is moved toward the door-closed position so that the resilient means will provide a door-closing moment and only the other of said rollers contacting said resilient means as the door is moved toward the fully opened door position so that the resilient means will provide a door opening moment.

3,931,665

STRIPPER MEANS FOR MEAT SKINNING MACHINES

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Aug. 23, 1974, Ser. No. 500,130
Int. Cl.² A22B 5/16
U.S. Cl. 17—21 12 Claims



1. In a device of the class described, a frame means,

a driven roll rotatably mounted on said frame means, said driven roll having a plurality of spaced apart annular grooves formed therein which extend inwardly into the peripheral surface thereof,

a skinning blade means on said frame means and positioned adjacent said driven roll for severing the skin from the product being skinned, the severed skin being gripped by said driven roll and being passed between the periphery of said driven roll and said skinning blade means,

a stripper shaft on said frame means below said driven roll,

a plurality of stripper elements detachably secured to said stripper shaft in a spaced apart relationship, each of said stripper elements having an arcuate hook portion which is received in one of said grooves in said roll so as to extend around a portion of said driven roll whereby said stripper elements will strip the severed skin from said driven roll,

said stripper elements each having a base portion with an opening in one of the margins thereof, said opening having inner margins which slidably embrace said shaft,

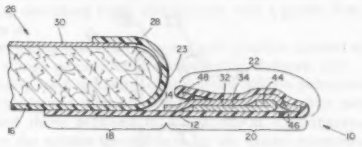
said shaft and said inner margins of said opening in said base portions each having complementary surfaces which engage one another to hold said stripper elements against rotation with respect to said shaft while at the same time permitting sliding movement of said stripper element radially outwardly from said shaft.

3,931,666

REUSABLE ADHESIVE DIAPER FASTENER

Hamzeh Karami, Crystal Lake, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Feb. 4, 1974, Ser. No. 438,991
Int. Cl.² A41B 13/02; B32B 3/04
U.S. Cl. 24—73 VA 6 Claims



1. A diaper fastener comprising a strip of tape having a pressure sensitive adhesive disposed over a surface thereof, a unit removably secured to said strip in a longitudinally central portion thereof, said unit providing an exposed surface facing away from said strip surface and having limited affinity for said adhesive, an end portion of said strip folded over and in contact with said exposed unit surface, said unit comprising outer and inner layers of web each of which has a surface which has limited affinity for said adhesive and which faces away from the other layer, said outer layer including tabs projecting longitudinally beyond the ends of the inner layer, said tabs secured to said strip surface, whereby said unit remains in said central strip portion when said end strip portion is removed from said exposed surface of said unit.

3,931,667

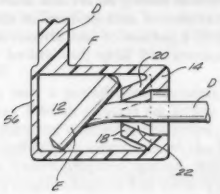
INTERLOCKING ATTACHMENT DEVICE

Francis G. Merser, Framingham Center, and Philip A. Kooistra, Northbridge, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed May 8, 1974, Ser. No. 467,918
Int. Cl.² B65D 55/06; A44B 9/00
U.S. Cl. 24—150 FP 14 Claims

1. An attaching device comprising a filament having a normally laterally oriented bar at one end and a hollow body member at its other end, at least one wall of said body member having an opening therethrough leading into the hollow interior of said member, said hollow interior having a greater width than said opening, an abutment defined therebetween, said filament being passable through said opening and said bar having a length greater than the maximum width of said opening and a thickness such that it is passable through said opening when said bar is oriented in a direction generally parallel to said filament, said bar when in a direction other than generally parallel to said filament being receivable in said hollow interior and engageable with said abutment, said body mem-

ber comprising a two piece assembly wherein said pieces are secured to one another, one of said pieces being integrally



connected to said filament, with one piece being an open-ended tube and the other piece being a closed-ended tube.

3,931,668

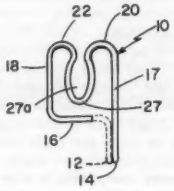
HOLDER FOR A KITCHEN UTENSIL

Carl J. Hombach, P.O. Box 22, West Hartford, Vt. 05084

Continuation-in-part of Ser. No. 437,488, Jan. 28, 1974, abandoned. This application Mar. 28, 1975, Ser. No. 562,977

Int. Cl.² A44B *21/00*

U.S. Cl. 24—261 A **11 Claims**



1. Apparatus comprising a kitchen utensil holder in combination with a clamp for mounting the holder to a pan or other container, said holder comprising first and second outer loops spaced laterally from one another, a third inner loop having an opening that is greater than the space between said first and second outer loops and connected to said outer loops by first and second connecting members, a support member attached to one of said outer loops, said support member having a portion defining an opening;

said clamp comprising two jaws and spring means normally holding said jaws in closed position, said spring means embodying a spring member that extends between and laterally of said jaws and has an opening extending therethrough;

a bolt extending through said opening and the opening in said spring member; and

fastening means for fastening said bolt so as to secure said holder to said clamp in a selected position.

3,931,669

LOOP PILE FABRIC CUTTING MODULE

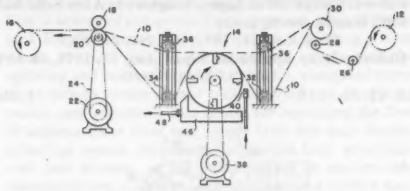
Michael William Gilpatrick, Chesnee, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 3, 1975, Ser. No. 554,740

Int. Cl.² D06C *13/08*

U.S. Cl. 26—9 **2 Claims**

1. A module for a loop pile fabric cutting machine comprising: a plurality of upwardly projecting cutting blade members, a plurality of cutting blade guard members adjacent said cutting blade members and projecting upwardly beyond said cutting blade members, a base member molded around said blade and guard members holding them in position, a pin member projecting through said base member and said guard members and a plurality of grooves in the base of said base member substantially parallel to said guard members to allow



said guard members to be pivoted to allow said blade members to be exposed.

3,931,670

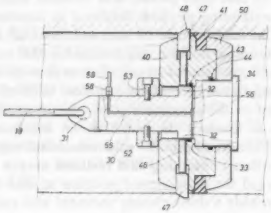
APPARATUS AND METHOD FOR CONNECTING TWO AXIALLY SPACED APART PIPES

James F. Arnold, Houston, Tex., assignor to HydroTech International, Inc., Houston, Tex.

Filed Apr. 25, 1974, Ser. No. 464,105

Int. Cl.² F16L *1/04*

U.S. Cl. 29—157 R **16 Claims**



1. In apparatus of drawing together the ends of two generally axially spaced apart conduits, the combination comprising:

a releasable pull plug arranged for mounting inside the end of one of said conduits, said plug having means for disengageably engaging the internal surface of said one conduit and locking said plug against axial movement relative thereto;

a line attached to said plug and extendable through said other conduit for exerting a pulling force thereon, whereby said two conduit ends may be drawn together by pulling on said line;

fluid actuated release means provided in said plug for disengaging said locking means from said conduit upon actuation thereof;

means operable in response to the actuation of said release means for holding said locking means in the disengaged position independently of said fluid pressure;

and means for applying pressurized fluid to said release means to thereby release said plug, whereby said plug after release thereof, and with said locking means held in said disengaged position, may be withdrawn through said other conduit by pulling on said line.

15. In a method of drawing together the ends of two generally axially spaced apart conduits, the combination comprising:

installing a releasable pull plug inside the end of one of said conduits, said plug being releasable in response to the application of fluid pressure thereto;

attaching a line to said plug and extending said line through said other conduit;

applying a tension force on said line to thereby draw said two conduit ends together;

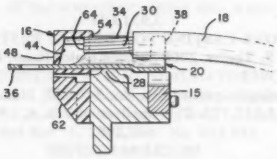
applying fluid pressure to said plug to thereby release said plug;
relieving said fluid pressure, with said plug remaining in said released condition;
and withdrawing said released plug from said conduits by pulling on said line, while said fluid pressure is relieved.

3,931,671

TERMINAL LOCATOR AND RETAINER DEVICE

Larry Eugene Dittmann, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 30, 1974, Ser. No. 510,338
Int. Cl.² H01R 43/04
U.S. Cl. 29—203 DT 6 Claims



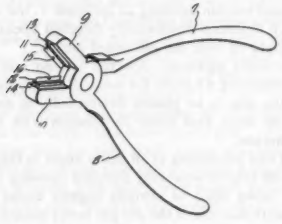
1. A terminal locator and retainer device for locating and retaining a terminal having a projecting tongue or the like in crimping means comprising: a block of deformable material having retaining means for removably receiving and frictionally retaining the tongue of a terminal and locating means for locating and positioning the terminal to a position on top of a bar-containing-anvil in the crimping means and further having wire retaining means for removably receiving and retaining a wire which may be terminated in the terminal.

3,931,672

DEFORMABLE WIRE STRIPPER

Dennis Siden, Portola Valley, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed June 19, 1974, Ser. No. 480,821
Int. Cl.² H02G 1/12
U.S. Cl. 29—427 6 Claims



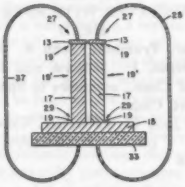
1. A process for stripping insulation from wire comprising contacting the insulation with a material exhibiting plastic or elastic deformation greater than that of a conductor with a force sufficient to cause substantial deformation of the insulation via penetration by the material into the insulation; pulling the insulation substantially along the wire axis while maintaining the penetration force, the pull force being sufficient to cause the insulation to sever at the point of penetration whereby the insulation may be stripped without deformation of the conductor.

3,931,673

ALUMINUM FOR BONDING SI-GE ALLOYS TO GRAPHITE

Robert V. Eggemann, Warren, N.J., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 8, 1969, Ser. No. 866,113
Int. Cl.² B01J 17/00
U.S. Cl. 29—573 1 Claim



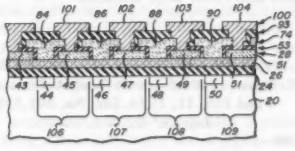
1. Method for producing a thermoelectric device having a graphite contact for a silicon-germanium thermoelectric element, comprising the steps of:
a. cleaning an aluminum shim by sequentially vibrating said aluminum shim in dilute NaOH, de-ionized water, strong HNO_3, deionized water and acetone, and a gentle flow of warm air;
b. sandwiching said shim between said graphite contact and said silicon-germanium thermoelectric element; and
c. bonding said graphite contact and silicon-germanium thermoelectric element with said aluminum shim sandwiched there between in a vacuum at a temperature above the solidus temperature for the silicon-germanium thermoelectric element.

3,931,674

SELF ALIGNED CCD ELEMENT INCLUDING TWO LEVELS OF ELECTRODES AND METHOD OF MANUFACTURE THEREFOR

Gilbert F. Amelio, Saratoga, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Feb. 8, 1974, Ser. No. 440,930
Int. Cl.² B01J 17/00
U.S. Cl. 29—578 9 Claims



1. A process for fabricating a charge coupled device structure in a semiconductor substrate, comprising the steps of
selectively applying at least one layer of insulation material to said semiconductor substrate;
selectively forming a plurality of spaced-apart first gate electrodes on the uppermost surface of said at least one layer of insulation material;
forming a first insulation layer over said plurality of first gate electrodes;
forming implanted barrier regions in said semiconductor substrate in the intervals between said plurality of spaced-apart first gate electrodes, the edges of said implanted barrier regions being aligned with the vertical edges of the insulation layer on the respective first gate electrodes;

selectively forming a plurality of second gate electrodes on said uppermost surface of said at least one insulating layer between said plurality of spaced-apart first gate electrodes, each of said second gate electrodes substantially occupying the space between adjacent first gate electrode; and

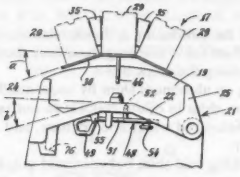
connecting each of said second gate electrodes to an individual adjacent first gate electrode to form a composite electrode for a charge coupled element.

3,931,675

ELECTRIC DRY SHAVER WITH RELEASABLE CUTTER HEAD

Peter A. Czerner, Trumbull; John F. Daniels, Bridgeport; Maurice A. Melito, Jr., Milford, and Edward Szymansky, Fairfield, all of Conn., assignors to Sperry Rand Corporation, Bridgeport, Conn.

Filed June 12, 1974, Ser. No. 478,715
Int. Cl.² B26B *19/04*
U.S. Cl. 30—41.6 12 Claims



7. In an electric dry shaver having a casing and a cutter head receptacle in said casing,

a. said receptacle including a bottom wall between a pair of opposed side walls,

b. a cutter head assembly including a plurality of cutter head units secured to a mounting plate,

c. said cutter head assembly disposed in said cutter head receptacle on one side of said bottom wall thereof,

d. latch means on said mounting plate extending through said bottom wall,

e. detent means on the opposite side of said bottom wall and including means in engagement with said latch means for releasably securing said cutter head assembly within the receptacle, and

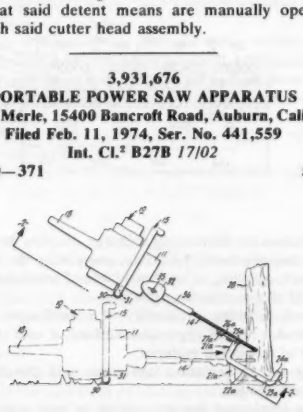
f. means for releasing said bottom wall from the casing whereat said detent means are manually operable to unlatch said cutter head assembly.

3,931,676

PORTABLE POWER SAW APPARATUS

William E. Merle, 15400 Bancroft Road, Auburn, Calif. 95602

Filed Feb. 11, 1974, Ser. No. 441,559
Int. Cl.² B27B *17/02*
U.S. Cl. 30—371 5 Claims



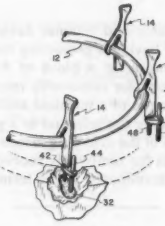
1. A portable power saw apparatus having in combination a casing assembly, a chain guide extending longitudinally therefrom and transversed along the edges thereof by an endless power driven saw chain, and a handle structure enabling said apparatus to be hand-held and manipulated the improvement comprising: a pair of legs secured to the chain adjacent the outer end-portion thereof remote from the casing assembly and extending laterally from the guide, said legs disposed in transversely spaced relation to define a size guage determinative of the largest diameter object accepted between said legs for severance by the chain saw, said legs' end portions forming a wide mouth to facilitate movement of severable objects through the spaces defined between said legs and into engagement with said saw chain, said legs providing a ground-engageable abutment in at least one operative position to support the outer end portion of the chain guide and saw chain and protect the same from groundengagement during certain cutting operations.

3,931,677

DIE STONE CASTING FOR DENTAL RESTORATION

Lawrence E. Tinder, 2900 Sawmill Gulch Road, Pebble Beach, Calif. 93953

Continuation-in-part of Ser. No. 340,937, March 13, 1973, Pat. No. 3,832,777. This application Feb. 6, 1974, Ser. No. 440,208
Int. Cl.² A61C *13/00*
U.S. Cl. 32—11 8 Claims



1. A die pin holder comprising an elongated clip having a major axis and three ends, the clip comprising:

means at one end of the clip along said axis for releasably receiving in depending generally axial relation at least one die pin;

a body disposed central of the three ends comprising a bifurcated section defining an inverted Y, the apex region of which defines a downwardly directed opening adapted to be force fit over die pin setter means;

a free normally upwardly directed second end along said axis comprising a handle for manually gripping the clip to cause the clip to be placed downwardly in and removed upwardly from said force fit relation with the die pin setter means;

said third end projecting at an acute angle in respect to said axis, with said downwardly directed opening at said apex region being sized to initially slightly under match the cross sectional size of the die pin setter means over which the die pin holder is force fit to enlarge the size of said opening equal to the size of the die pin setter means.

3,931,678

DENTAL FILLING METHOD AND COMPOSITION FORMED THEREBY

Denis J. O'Sullivan, and T. Eisirt Casey, both of Dublin, Ireland, assignors to Loctite (Ireland) Limited, Dublin, Ireland

Filed Sept. 24, 1974, Ser. No. 503,992
Int. Cl.² A61K *5/02*
U.S. Cl. 32—15 7 Claims

1. A process for repairing dental caries which comprises:

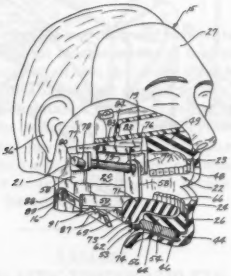
a. Removing decayed tooth structure to form a dental cavity;
b. Filling said cavity with a dental filling composition comprising
1. a urethane-acrylate monomer formed by the reaction of an organic polyisocyanate with a polymerizable acrylate ester having a hydroxy or amino group in the alcoholic moiety thereof;
2. a free-radical polymerization initiator; and
3. an inorganic filler;
c. Applying an aqueous solution of about 25 percent to about 60 percent by weight waterglass to the surface of the composition and allowing the water to evaporate to leave a solid, essentially oxygen-impermeable coating of waterglass;
d. Permitting said composition to harden to form a restored dental surface; and
e. Washing off the waterglass coating with water.

3,931,679

DENTAL PATIENT SIMULATOR

Donald F. Carter, South Pasadena, Calif., assignor to Den-Tal-Ez Mfg., Co., West Des Moines, Iowa

Filed Nov. 5, 1973, Ser. No. 413,051
Int. Cl.[2] G09B *19/00*
U.S. Cl. 32—71 **5 Claims**



1. A dental practice device for simulating dental conditions of a dental patient, said device comprising:
a. a simulated human head including a skull having an upper jaw fixed thereto,
b. a movable lower jaw,
c. means movably supporting the lower jaw on the skull for up and down pivotal movement toward and away from the upper jaw and for transverse movement relative to the upper jaw including means for releasably holding the lower jaw in a pivotally moved position and means providing for a transverse movement of the lower jaw in all pivotally moved positions thereof,
d. practice dentures corresponding to and releasably secured to said upper and lower jaws, and
e. a covering skin for said skull, upper jaw and lower jaw simulating the human skin and including a mouth portion, said skin forming with said jaws a mouth cavity to which access is had only through said mouth portion.

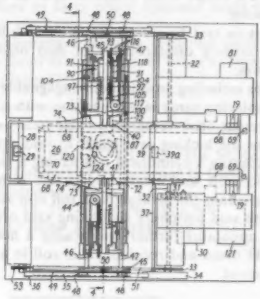
3,931,680

FOOT MEASURING MACHINES

Christopher John Greensides, Waltham on the Wolds, near Melton Mowbray, England, assignor to Clarks Limited, Somerset, England

Filed Jan. 23, 1974, Ser. No. 435,946
Int. Cl.[2] A43D *1/00*
U.S. Cl. 33—3 B **14 Claims**

1. A foot measuring machine comprising a chassis, a platform for supporting a foot, said platform being mounted on the chassis, a heel stop and a toe stop for respectively engaging the heel and toe of the foot, said stops being spaced apart lengthwise of the platform, a main carriage mounted on the chassis for guided movement lengthwise of the platform, cam means extending lengthwise of the platform and providing laterally oppositely facing cam surfaces, said cam means being mounted on the chassis for free sideways movement with respect to the platform, trolleys mounted on the carriage at opposite sides of the platform for guided movement relative to the carriage in a direction at right angles to the lengthwise dimension of the platform for engaging opposite sides of the foot, cam followers secured to the respective trolleys and respectively engaging said cam surfaces, means connected to urge the trolleys resiliently towards each other, a pair of width probes each of which is mounted on a separate said trolley to engage opposite sides of the foot, one of said width probes being fixed on its respective trolley and the other of said width probes being mounted for guided movement relative to its trolley in a direction at right angles to the lengthwise dimension of the platform, means for relatively moving the heel stop, toe stop and carriage in a direction lengthwise of the platform and maintaining the distance between the width probes and the heel stop at substantially three-quarters of the distance between the toe stop and the heel stop, first measuring means providing a measure of the distance between the toe and heel stops thereby to provide a measure of the length of the foot, means for moving said other width probe relative to its trolley



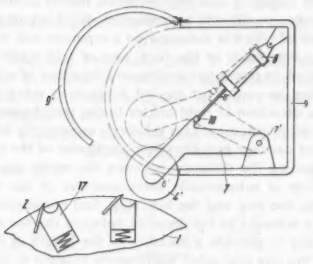
in a direction at right angles to the lengthwise dimension of the platform, and second measuring means providing a measure of the distance travelled by said other width probe relative to its trolley in moving from an initial position into a position in which the two width probes are in engagement with opposite sides of the foot thereby to provide a measure of the width of the foot.

14. A foot measuring machine comprising a platform for supporting a foot, a heel stop and a toe stop mounted above said platform for respectively engaging the heel and toe of the foot, which stops are spaced apart lengthwise of the platform, a main carriage mounted for guided movement lengthwise of the platform, means for moving the heel stop, toe stop and carriage relative to each other in a direction lengthwise of the platform and maintaining the distance between a point on the carriage and the heel stop at substantially three-quarters of the distance between the heel and toe stops, and at least one girth probe mounted on the carriage, first and second tape anchorages on the carriage, a flexible tape having its ends attached to said anchorages and extending in a direction normal to said lengthwise direction around the probe between said anchorages, means for moving the probe across the instep of a foot on the platform thereby to lay said tape across the instep of the foot and means for indicating a measure of the length of tape so laid thereby to provide a measure of the girth of the foot.

3,931,681
SYSTEM FOR SETTING BLADES OF A CUTTER DRUM OF A WOOD CHIPPER

Ferdinand Sybertz, Bienenweg, 6551 Hargesheim, Germany

Filed Sept. 7, 1973, Ser. No. 395,362
Claims priority, application Germany, Sept. 8, 1972, 2244077
Int. Cl.² B27G 23/00
U.S. Cl. 33—185 R 3 Claims



1. An apparatus for setting a straight-edged blade on a cylindrical cutter drum rotatable abut an axis, said apparatus comprising:

means on said drum for holding said blade on said drum and permitting displacement of said blade relative to said drum;

means including an abutment engageable with said blade for displacing same into a position with said edge lying on a circular orbit centered on said axis; and

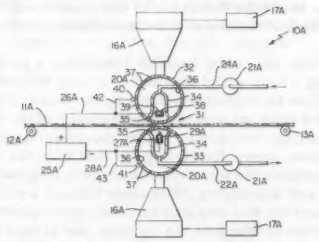
means for locking said blade to said drum, said abutment including a cylindrical roll having a periphery osculating said orbit, said means engageable with said blade including means for pivoting said roll into and out of a position with said periphery osculating said orbit.

said apparatus further comprising a housing spaced from said drum and receiving said roll in a retracted position thereof.

3,931,682
LIQUID REMOVING METHOD AND APPARATUS

James T. Candor, 5440 Cynthia Lane, Dayton, Ohio 45429

Filed May 14, 1974, Ser. No. 469,820
Int. Cl.² B01K 5/00
U.S. Cl. 34—1 20 Claims

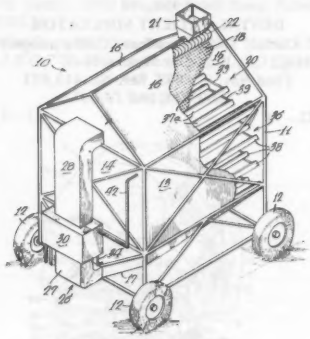


1. Apparatus for removing moisture from moisture bearing material comprising means for supporting said material, vibrating means for vibrating said supported material, and electrostatic means for electrostatically removing moisture from said vibrating material, said vibrating means and said electrostatic means being in aligned relation substantially transverse to said supported material to respectively and substantially act in unison thereon, said vibrating means including part of said electrostatic means.

3,931,683
DRYER FOR PARTICULATE MATERIAL

Ray D. Crites, 4324 Westbrook Drive; David A. Block, 318 Hilltop St., and Paul H. Sidles, 1506 Wilson St., all of Ames, Iowa 50010

Filed Nov. 18, 1974, Ser. No. 524,761
Int. Cl.² F26B 17/12
U.S. Cl. 34—169 13 Claims



1. A dryer for particulate material comprising, in combination:

a drying chamber through which particulate material flows by gravity;

first air lock means for admitting particulate material to the upper end of said drying chamber;

second air lock means for removing particulate material from the lower end of the drying chamber;

a thermal pump system including a compressor having a low pressure side and a high pressure side, radiator means in the drying chamber which is directly contacted by said particulate material as it passes through said chamber, said radiator means having an inlet and an outlet, a condenser, a hot fluid conduit connecting the high pressure side of the compressor to the radiator inlet, a cool fluid conduit connecting the radiator outlet to the condenser, and a fluid return conduit from the condenser to the low pressure side of the compressor;

a closed duct system which includes the drying chamber, and blower means in the duct system to circulate gas through said drying chamber in countercurrent to the flow of particulate material so as to absorb moisture vaporized from the material;

means for heating said gas in the duct system before it enters the drying chamber, the condenser of the thermal pump system being positioned in the duct system upstream from the heating means where it condenses moisture from the gas which has left the drying chamber;

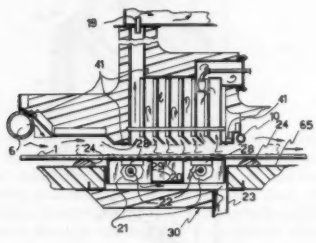
and condensate discharge means for removing condensed moisture from the duct system.

3,931,684

VAPOR CHAMBER FOR DRYING

James O'Hara Turnbull; William Lipscomb Merritt, both of Cowansville, and Ivan Patrick McLaughlin, Sutton, all of Canada, assignors to J. J. Baker Company Limited, Cowansville, Canada

Division of Ser. No. 406,626, Oct. 15, 1973, Pat. No. 3,851,402. This application Oct. 7, 1974, Ser. No. 512,459
Int. Cl.² F26B 25/00
U.S. Cl. 34—242 3 Claims



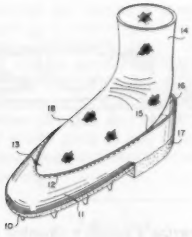
1. A curing chamber having entry and exit ports for passing articles therethrough, air curtain means at said inlet and exit ports to prevent entry of air into the curing chamber, communicating means connecting the air curtain means at said inlet and outlet ports to maintain a pressure equilibrium at the air curtains, means for supplying from outside the air curtain means in a direction inwardly of the curing chamber a controlled heated moist vapor providing predetermined moisture to the air curtains thereby reducing the escape of volatile gases from within the curing chamber.

3,931,685

LACELESS ELASTIC-TOPPED ATHLETIC SHOE

Hubert T. Laukaitis, P.O. Box 2406, Arlington, Va. 22202

Filed Nov. 15, 1974, Ser. No. 524,125
Int. Cl.² A43B 11/00
U.S. Cl. 36—2.5 A 4 Claims



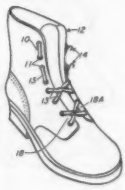
1. A laceless athletic shoe comprising a sole, a narrow strip attached to the entire edge of said sole and upstanding therefrom; an elasticized panel connected to the forward portion of said narrow strip, said elasticized panel encompassing the instep, and an elasticized ankle-encompassing member integral with and being a continuation of said elasticized panel; the rearward portion of the lower edge of said ankle-encompassing member being free rearwardly of the heel breast line, from connection to said narrow upstanding strip.

3,931,686

ELASTIC LACE AND HOOK FASTENER

Archie B. Rathbun, P.O. Box 237, Sommers, Mont. 59932

Filed Feb. 25, 1974, Ser. No. 445,779
Int. Cl.² A43B 11/00
U.S. Cl. 36—51 3 Claims



1. A fastening device for a lace-type closure having adjacent opposed fastening flaps with plural eyelets spaced inwardly adjacent each opposed edge of the flaps, and comprising, in combination:

paired, elongate elastic laces configured to allow insertion through the eyelets in each fastening flap but be bindable in the said eyelets when stressed away therefrom, each of said laces being laced through adjacent eyelets in each of the fastening flaps to form plural opposed loops on the fastening side of the flaps, and

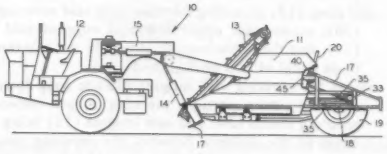
plural fastening members releasably fastening paired opposed fastening loops to each other to cause a releaseable fastening of the laceable closure.

3,931,687

REAR EJECTOR ROLLER AND GUIDE FOR SCRAPER

Robert C. Johns, Jr., Lubbock, Tex., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Nov. 13, 1974, Ser. No. 523,309
Int. Cl.² B60P 1/36; E02F 9/28
U.S. Cl. 37—8 3 Claims

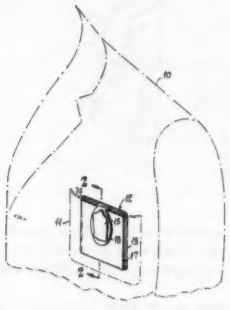


1. An earth moving scraper having sidewalls, a fixed floor portion extending between the sidewalls, an ejector extending between the sidewalls and movable into and out of the space between the sidewalls over the fixed floor portion, a rigid frame structure attached to the scraper at the rear, an ejector frame secured to and movable with the ejector and projecting rearwardly into the rigid frame structure, a pair of beveled rollers, one on each side of the ejector frame, a pair of parallel tracks, one on each side of the rigid frame structure having spaced, inclined surfaces on which the beveled edges of said rollers travel, a pair of rollers having intersecting axes of rotation mounted on each side of the ejector and spaced forwardly of said beveled rollers, a separate track on each side wall of the scraper having upper and lower inclined surfaces on which said pairs of rollers travel which together with said beveled rollers cooperate for maintaining the ejector in proper alignment while moving into and out of the space between the side wall of the scraper.

3,931,688
POCKET-SIZE COMBINATION STORAGE AND DISPLAY CASES FOR INSIGNIA MEMBERS

John C. Owens, 1611 17th St., Bedford, Ind. 47421

Filed July 16, 1974, Ser. No. 488,973
Int. Cl.² A44C *3/00*
U.S. Cl. 40—1.5 4 Claims



1. A unitary insignia storage and display case (12) for use on an upright garment pocket (11) having a front and a back panel, the upper marginal edge of the front panel being substantially horizontal and cooperating with the back panel to form a pocket opening, said case comprising:

a pair of integral rectangular sections (13, 17) foldable to parallel positions in which at least two of the side edges of the respective sections sunstantially coincide;

said folded sections (13, 17) being insertable through said opening and into said pocket with said coinciding side edges uppermost and adjacent said upper marginal pocket edge;

the inner face of one of said folded sections (13, 17) being recessed to form a storage compartment (14) for said insignia (15);

a flexible suspension strap (18);

means (30) for securing one end of said strap (18) to said recessed section (13);

said strap (18) extending laterally from said securing means (30), across said upper marginal edge of said pocket (11), and then downwardly alongside the exterior of the front panel of said pocket, and

means for securing said insignia (15) to said downwardly extending strap portion, the strap length between said securing means (30) and said insignia (15) being at least equal to the distance between the securing means and said compartment (14) whereby said insignia while connected to the case may be selectively displayed in suspended position on the exterior of said pocket front panel or stored within said compartment.

3,931,689
ILLUMINATED SIGN HOUSING CONSTRUCTION

William P. Shine, Monroe, Conn., assignor to Dual-Lite Company, Newtown, Conn.

Filed June 12, 1974, Ser. No. 478,521
Int. Cl.² G09F *13/06*
U.S. Cl. 40—132 R 23 Claims

1. A sign housing comprising:

A. a frame member incorporating

a. a bottom portion,

b. a top portion and

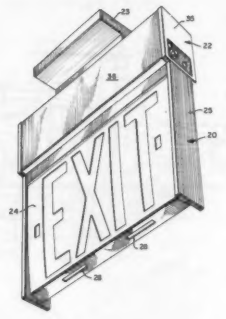
c. two side portions interconnecting said top and bottom portions;

B. a rear panel removably mounted to said frame member and engageable with said top and bottom portions of said frame member; and

C. a flexible front panel

a. removably mounted to said frame member,

b. vertically slidingly engaged with said frame member along a substantial portion of the side portions thereof in substantially the same vertical plane from a first latched position to a second opened, retained position with said front panel vertically extending below said bottom portion and



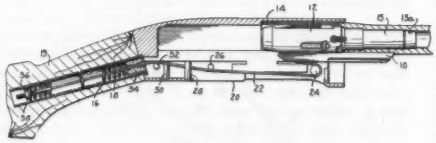
c. dimensioned for flexible latched cooperation with said frame member to secure said front panel in said first latched position,

whereby access to the interior of the sign housing can be made while said front panel is retainingly suspended in its second position, vertically below the sign housing.

3,931,690
ACTION BAR-ACTION SPRING LINK USING FLEXIBLE WIRE

Kenneth Wilfred Soucy, Richfield Springs; Thomas James Plunkett, Ilion, and Kenneth Charles Rowlands, Utica, all of N.Y., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Mar. 8, 1974, Ser. No. 449,226
Int. Cl.² F41C *11/00;* F41D *11/12*
U.S. Cl. 42—16 10 Claims

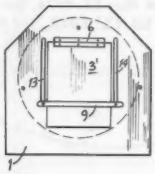


1. In a firearm having a barrel, a chamber in said barrel for receiving a cartridge, a receiver frame attached to said barrel and a gun stock attached to said frame, a breech bolt means mounted in said frame for reciprocable movement between a forward breech closing position and a rearward breech open position, action spring means mounted in said gun stock, and flexible wire means connected at one end to said action spring means and at the other end to said bolt means, a stationary guide means mounted on said frame for guiding said wire means so that upon rearward movement of said bolt means into breech open position, said spring means is biased to resist the rearward movement of said bolt means and to urge the bolt means forwardly into breech closed position.

3,931,691
DOOR DEVICE

Thomas J. McCord, Harrisonville, Mo., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 11, 1974, Ser. No. 432,761
Int. Cl.² A01M 23/18
U.S. Cl. 43—61 3 Claims

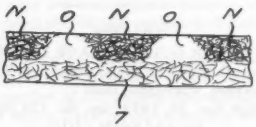


1. A door device for a door hingedly affixed to a housing for covering an opening thereof, said door being affixed to the housing at the top of the door, said door device comprising door locking means on the housing at the door, said door locking means comprising a pair of substantially parallel guide slots formed through the housing on opposite sides of the opening and a pair of substantially parallel slide rods slidably mounted for movement up and down on opposite sides of the door, said slide rods being affixed to each other at the slots and extending across the opening whereby when the door is open it supports the slide rods and when it closes, the slide rods slide down and bar the door.

3,931,692
INSECT EXTERMINATOR PAD

William A. Hermanson, 3700 Galt Ocean Drive, Fort Lauderdale, Fla. 33308

Filed Sept. 20, 1974, Ser. No. 507,776
Int. Cl.² A01M 1/20
U.S. Cl. 43—131 11 Claims



1. An insecticidal pad having a quantity of poison food particles covered by a paper web having openings on the inside which are substantially larger than the feelers and mouth parts of *Blatella germanica* cockroach nymphs, said web on the outside having dispersed fibers which overlie and cross over said openings in random fashion over substantially the complete cross-sectional area of said openings and which the feelers and mouth parts of said nymphs can readily displace laterally and penetrate between to reach the poison food through said openings.

3,931,693
DUMP MECHANISM FOR TOY TRUCK

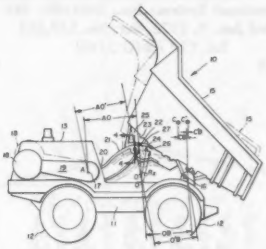
James C. Alexander, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Mar. 17, 1975, Ser. No. 558,678
Int. Cl.² A63H 17/06
U.S. Cl. 46—214 10 Claims

1. In a toy truck having a chassis, a dump body mounted on a rear region of said chassis to pivot between a load position and a full-dump position, a simulated cab in a forward region of said chassis, and a dump lever pivotally mounted on said chassis near said simulated cab, an improved dump mechanism comprising:

a. said dump lever having an upper surface curving downward toward a lifting end of said dump lever;

b. said dump body having an undersurface engaged by said curved surface of said dump lever; and

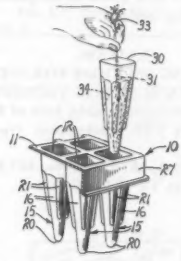


c. said curved surface of said dump lever and said body undersurface being shaped for pivoting said dump body in pivotal increments that increase successively relative to corresponding successively equal pivotal increments of said dump lever throughout at least the initial half of the motion of said dump body from said load position to said full-dump position.

3,931,694
PLANTING FLAT

Peter K. Krikorian, Fresno, Calif., assignor to Haig K. Krikorian, Fresno

Filed June 13, 1974, Ser. No. 478,951
Int. Cl.² A01G 9/02, 9/10
U.S. Cl. 47—34.13 2 Claims



1. A planting flat comprising a unitary body of sheet material having a plurality of downwardly tapering cells of a common vertical length having open upper ends and closed lower ends disposed in respective upper and lower substantially parallel planes, an upper panel interconnecting the upper ends of said cells into rows that are of substantially parallel adjacent relationship, each unitary cell having a transversely substantially square upper portion defined by vertically substantially parallel, right angularly related pairs of oppositely disposed walls, and having substantially frusto-conical unitary central and lower portions continuous with the walls of said upper portion and tapering uniformly downwardly along a common longitudinal axis from the upper square portion to a closed lower end, the central portion being defined by a plurality of unitary longitudinally extending concave reinforcing ribs extending downwardly from each corner of said square upper portion to said lower portion to enhance the rigidity of said central portion, said ribs extending radially beyond the taper of said central portion and defining openings at their lower ends spaced outwardly from the remaining tapered lower portion whereby excess water can drain from said cell, said openings being upwardly spaced in relation to said lower

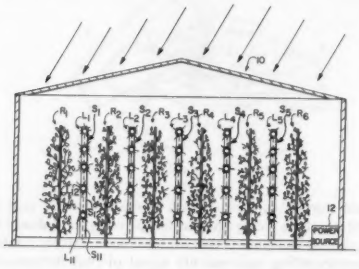
portion of the cell, the tapered lower portion below the openings being inperforate to define a reservoir therein.

3,931,695

PLANT GROWTH METHOD AND APPARATUS

Don Frederick Widmayer, Bethesda, Md., assignor to Controlled Environment Systems Inc., Rockville, Md.

Filed Jan. 9, 1975, Ser. No. 539,866
Int. Cl.² A01G 31/02
U.S. Cl. 47—58 14 Claims



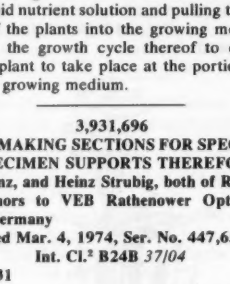
1. A method for growing higher order plants, said method comprising locating at least one fluoroescent lamp in close proximity to the plants to be grown at a level lower than the tops thereof and pulsing the lamp on a limited duty-cycle so as to keep the bulb wall temperature of the lamp below a value that would damage the plant, said method further comprising providing a growing medium for at least one of the plants including a liquid nutrient solution and pulling the stem of said at least one of the plants into the growing medium at a selected time in the growth cycle thereof to enable further rooting of the plant to take place at the portion of the stem pulled into the growing medium.

3,931,696

DEVICE FOR MAKING SECTIONS FOR SPECIMENS AND SPECIMEN SUPPORTS THEREFOR

Wolfgang Lorenz, and Heinz Strubig, both of Rathenow, Germany, assignors to VEB Rathenower Optische Werke, Rathenow, Germany

Filed Mar. 4, 1974, Ser. No. 447,655
Int. Cl.² B24B 37/04
U.S. Cl. 51—131 13 Claims



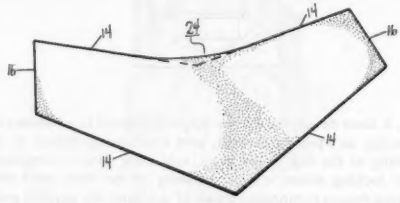
1. A device for making sections for specimens, for thin sections and ground surfaces of metallographic specimens for microscopic analyses, comprising a housing; a rotatable polishing wheel therein; frictional drive means disposed centrally on said wheel and rotating therewith; at least two specimen supports symmetrically carried above said wheel in a freely rotatable, removable and interchangeable manner; at least one intermediate roller pivotally supported adjacent the peripheries of a pair of adjacent ones of said supports for transmitting to the latter rotation from said drive means in a direction identical with that of said wheel; said supports as well as said roller having complementary interengaging peripheral surfaces that are partly cylindrical and partly conical; and means for adjusting the location and degree of interengagement between the respective surfaces.

3,931,697

MODULAR CURVED SURFACE SPACE STRUCTURES

Peter J. Pearce, Studio City, Calif., assignor to Synestructics, Inc., Chatsworth, Calif.

Continuation of Ser. No. 216,488, Jan. 10, 1972, abandoned.
This application May 13, 1974, Ser. No. 469,416
Int. Cl.² E04B 1/32
U.S. Cl. 52—80 8 Claims



1. A saddle-like polygonal surface module for defining, in conjunction with other, related modules, space enclosing structures, the module comprising:

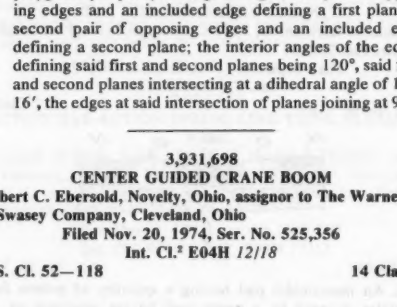
a nonplanar, skew polygonal periphery, having a substantially minimal surface membrane extending to the periphery thereof to define a saddle-like, structural module, said polygonal periphery having six edges, one pair of opposing edges and an included edge defining a first plane, a second pair of opposing edges and an included edge defining a second plane; the interior angles of the edges defining said first and second planes being 120°, said first and second planes intersecting at a dihedral angle of 125° 16′, the edges at said intersection of planes joining at 90°.

3,931,698

CENTER GUIDED CRANE BOOM

Robert C. Ebersold, Novelty, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Nov. 20, 1974, Ser. No. 525,356
Int. Cl.² E04H 12/18
U.S. Cl. 52—118 14 Claims

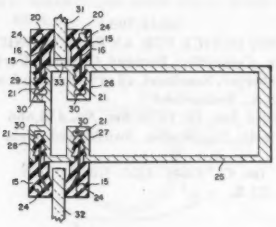


1. An extensible boom assembly comprising, in combination a base section, at least one additional extensible and retractible boom section telescopically received in said base section, the sections of the extensible boom assembly having a generally rectangular transverse cross section including top, bottom and side walls, said side walls having projections, said projections of contiguous boom sections being complementary to one another, and bearing means having a load bearing surface interposed between contiguous projections.

3,931,699
GLAZING SYSTEM

J. Thomas Sarvay, Rush, N.Y., assignor to Schlegel Manufacturing Company, Rochester, N.Y.

Filed May 20, 1974, Ser. No. 471,323
Int. Cl.² E06B 3/62
U.S. Cl. 52—476 14 Claims



1. A glazing system for a window glass or a panel, said system comprising:

a. a structural frame having an opening slightly larger than said window glass or panel around the entire periphery of said window glass or panel;

b. an interior and an exterior glazing strip holding said window glass or panel in place in said frame;

c. each of said glazing strips having a resilient reinforcing member and an elastomeric material extruded over and covering said reinforcing member;

d. said glazing strips having a single anchorage base and laterally spaced therefrom a retainer-sealing portion, and said reinforcing member extending from said retainer-sealing portion into said anchorage base;

e. a pair of rigid receivers each having a channel shaped to interlock with said anchorage base of one of said glazing strips and extending around the periphery of said frame, lengths of said glazing strips being secured in said receivers to engage and seal opposite surfaces of said window glass or panel around said periphery of said window glass or panel;

f. the configuration and material of said reinforcing member being selected for resiliently pressing and sealing said retainer portion of said glazing strip against window glass or panel with a force of approximately 4–6 pounds per linear inch around said periphery of said window glass or panel; and

g. said anchorage base being insertable into said interlocking relation with said receiver and being removable from said receiver only by deliberate force for replacing said window glass or panel.

3,931,700
SURFACES PRODUCED BY INTERLOCKING MEMBERS

Nino V. Scanni, and Iberio E. Scanni, both of Edmonton, Canada, assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

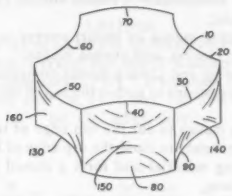
Filed Aug. 16, 1974, Ser. No. 497,924
Int. Cl.² E01C 5/00
U.S. Cl. 52—590 1 Claim

1. A member which when located in a plane in abutting relationship with a plurality of other like members defines a planar surface which will remain flat when pressure is applied along the thickness of the surface from two opposed directions, the member comprising:

a body having upper and lower flat, parallel main faces joined by six curved side faces that are connected end to end to define an endless closed path,

the upper main face having a periphery of six sections connected end to end, the sections defining congruent circular arcs that are alternately concave and convex,

the lower main face being identical to the upper main face but being rotated through 60° of arc with respect to it to vertically align the endpoints of the sections so that the endpoints of each concave section in each main face is vertically aligned with the endpoints of a corresponding convex section in the other main face,



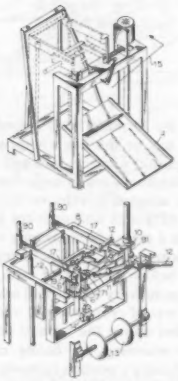
each concave section, its corresponding convex section and their vertically aligned endpoints defining the periphery of one of the curved side faces, and

each side face being further defined by the collection of straight lines of varying vertical slope which extend between corresponding points on each corresponding pair of sections, said lines having an infinite slope at the endpoints and having steadily decreasing slopes as their distance to the midpoints of the sections decreases.

3,931,701
AUTOMATIC PRODUCE-BAGGING MACHINE THAT USES FACTORY-ROLL POLYETHYLENE NET TUBING

Earl K. Bowman, and John C. Teele, both of Gainesville, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 484,198, June 28, 1974, abandoned. This application Mar. 28, 1975, Ser. No. 563,256
Int. Cl.² B65B 57/10, 43/00
U.S. Cl. 53—59 R 6 Claims



1. An automatic produce-bagging machine that uses factory-roll polyethylene net tubing material for bag fabrication and comprising in combination:

a. a frame;

b. a polyethylene net material spreading means;

1. an actuating means for said spreading means;

c. an opening and gripping means;

1. an actuating means for said opening and gripping means;

d. a bottom gathering, closing, and cutting means comprising:
1. a means of imparting swing movement to said closing means;
2. a means of gathering the polyethylene net material;
3. a means of cutting said polyethylene material;
4. a stapling device to staple the polyethylene material and form substantially a closed bottom of a polyethylene net bag;
5. an actuating means to impart energy to said bottom gathering, closing, and cutting means;

e. a top gathering and closing means comprising:
1. a gathering means to gather the top of the polyethylene bag;
2. a cutting means to cut the top edge of the bag even;
3. a stapling means to close the top edge of the polyethylene netting material and form a closed container for the produce;
4. an actuating means to impart energy to said top gathering, closing, and cutting means;

f. an automatic counting means to count the produce into the bag; and

g. a means of supplying the polyethylene net material to the automatic bagging machine.

3,931,702

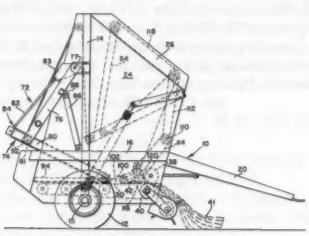
MACHINE FOR FORMING CYLINDRICAL HAY BALES

Gust Soteropulos, and Gerald Franklyn Meiers, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed July 17, 1974, Ser. No. 489,349

Int. Cl.[2] A01D *39/00*

U.S. Cl. 56—341 **11 Claims**



1. A machine for forming large cylindrical bales of crop material such as hay or the like comprising: a mobile main frame having opposite, upright, fore and aft sides defining a baling chamber therebetween; a crop delivery means carried by the frame and adapted to remove the crop from the field as the machine advances and delivers it rearwardly to the baling chamber in a mat; a bale forming mechanism disposed between the opposite sides and including a lower conveyor means generally below the path of crop material when it is delivered from the delivery means and adapted to support the underside of the mat of crop material and the bale formed in the baling chamber above the ground and an upper endless conveyor means spanning the baling chamber, the upper conveyor means having a portion opposite the lower conveyor means to form a baling zone therebetween wherein the mat of material is rolled into a cylindrical bale; and a rear gate assembly including a first pair of interconnected parallel arms pivotally connected to the opposite sides of the machine for swinging in unison in vertical arcs about a common transverse axes, a second pair of parallel arms respectively pivotally connected to the first arms for swinging in vertical arcs about a transverse axis, a first transverse roller extending between the second arms parallel to the pivot axis of the second arms and defining the rearward end of the baling zone, the first and second pairs of arms swinging rearwardly so that the roller moves rearwardly as a bale grows in the baling zone, the upper conveyor means being trained around said roller, a linkage means connecting the second pair of arms to the frame so that the first roller moves in a path generally parallel and adjacent to the lower conveyor means as the bale grows, and power means selectively operative to swing the gate assembly arms upwardly and rearwardly so that the first roller is spaced above the lower conveyor means to permit the rearward discharge of a formed bale.

3,931,703

CORRECTING DEVICE FOR AN ELECTRONIC WATCH

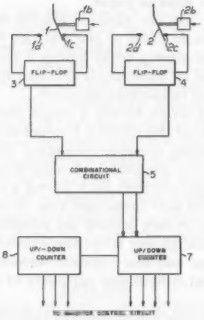
Igor Scherrer, Colombier; Fernand Chetelat, Cortaillot, and Pierre Hersberger, Neuchatel, all of Switzerland, assignors to Ebauches S.A., Switzerland

Filed Jan. 18, 1974, Ser. No. 434,666

Claims priority, application Switzerland, Feb. 27, 1973, 2800/73

Int. Cl.[2] G04C *3/00*; G04B *27/08*

U.S. Cl. 58—23 R **4 Claims**



1. A time setting circuit for correcting the time setting of an electric timepiece of the type having a pulse generator having an output frequency set to a predetermined nominal value, a divider circuit receptive of the pulse generator output for developing a time signal having a frequency determined by the divider circuit, a controllable inhibitor circuit for blocking selected pulse generator output pulses from the divider circuit, and a time indicating mechanism driven by the time signal, wherein the time setting circuit comprises:

a. two bistable circuits each having an output representative of a conductive state of the respective bistable circuit;

b. two switches each connected to control the conductive state of a respective one of said two bistable circuits;

c. an up/down counter for counting pulses;

d. means for applying the count stored in said up/down counter to the controllable inhibitor circuit to control the number of pulses blocked by said inhibitor circuit and thereby control the time indicating mechanism; and

e. a combinatorial circuit receptive of the outputs of said two bistable circuits for applying pulses to said up/down counter for increasing the count stored therein in response to actuation of a first of said two switches and for applying pulses for decreasing the count stored therein in response to actuation of a second of said two switches.

3,931,704

WATCH CASE AND METHOD FOR MANUFACTURING THE SAME

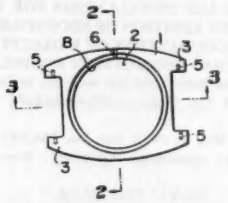
Hiroshi Tominaga, and Masanobu Takamatsu, both of Yokohama, Japan, assignors to Tokyo Sharyo Seizo Kabushiki Kaisha, Japan

Filed Oct. 23, 1973, Ser. No. 408,870

Claims priority, application Japan, Oct. 24, 1972, 47-106576

Int. Cl.² G04B *37/00*; B23P *13/00*; B22F *5/00*

U.S. Cl. 58—88 R 10 Claims



1. For use in a watch, a one-piece case having a back wall and a side wall projecting forwardly from said back wall and surrounding a space which is closed at one end of said side wall by said back wall and which is open at an opposed end of said side wall, said side wall having a pair of opposed regions each of which carries a pair of laterally extending lugs for supporting a watch-band holding rod, said lugs forming an integral part of said one-piece case and said one-piece case being formed in its entirety of sintered diamond particles, the thickness of said back wall and the dimension of said side wall between said ends thereof being less than the thickness of the side wall and back cover of a metal watch case of comparable strength.

3,931,705

COUNTER FEED MECHANISM AS USED IN DIGITAL CLOCK

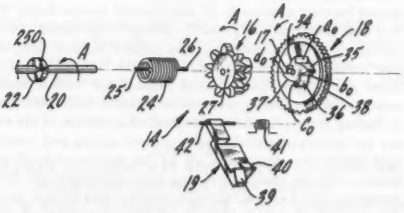
Koichi Iwaki, Hino; Atsushi Wakabayashi, Gyoda; Yukihiro Nagahori, and Shiro Nakagawa, both of Tokyo, all of Japan, assignors to Jeco Kabushiki Kaisha, Japan

Filed June 24, 1974, Ser. No. 482,421

Claims priority, application Japan, June 26, 1973, 48-75097[U]; June 26, 1973, 48-75098[U]; June 26, 1973, 48-75099[U]

Int. Cl.² G04B *19/02*

U.S. Cl. 58—125 C 8 Claims



1. A counter feed mechanism for use in a digital clock comprising in combination, a first cam member adapted for advanced rotation, a second cam member adapted for delayed rotation with respect to said first cam member, both of said cam members being arranged on a common rotational axis, a rotary clock mechanism, means coupling said clock mechanism to said first cam member for rotation of same, spring means coupled to said second cam member and arranged to be charged by rotation of said clock mechanism, lock means engaging said second cam member for preventing rotation thereof, said first cam member including means for releasing said lock means after a predetermined amount of rotation of said first cam member thereby to allow said spring means to advance said second cam member, and a rotary wheel coupled to said second cam member, whereby energizing of said clock mechanism causes said rotary wheel to advance in step by step fashion.

3,931,706

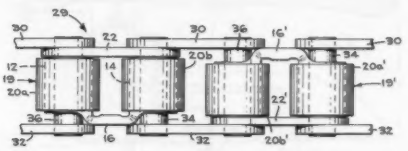
METHOD OF MAKING A BUSHING LINK CHAIN

John F. McKeon, Carmel, and Roy E. Lambert, Indianapolis, both of Ind., assignors to FMC Corporation, San Jose, Calif.

Filed Dec. 20, 1974, Ser. No. 535,070

Int. Cl.² B21L *9/04*

U.S. Cl. 59—4 5 Claims



1. In a method of making a chain, the steps of forming a blank that includes a pair of parallel bushing forming strips connected intermediately by a web, bending the web to position the strips perpendicular to the original plane of the web and parallel with each other, and curling each strip outwardly from the other strip to form a bushing link having a pair of bushings integral with the web that serves as an inside plate.

3,931,707

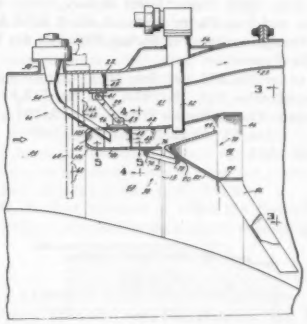
AUGMENTOR FLAMEHOLDING APPARATUS

John William Vdoviak, Marblehead, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Jan. 8, 1975, Ser. No. 539,315

Int. Cl.² F02C *3/00*; F02K *3/10*

U.S. Cl. 60—39.72 R 11 Claims



1. A flameholder for the afterburner of a gas turbine engine comprising:

an inner ring,

an outer ring spaced radially outward from and concentric to the inner ring to form an annular flow passage therebetween for receipt of the hot gases exhausted from the engine turbine,

means for introducing pilot fuel into the flow passage to mix with the hot gases therein,

means within the flow passage for imparting a circumferential swirl to the fuel gas mixture flowing therethrough,

means for igniting the swirled fuel gas mixture to generate a pilot flame, and

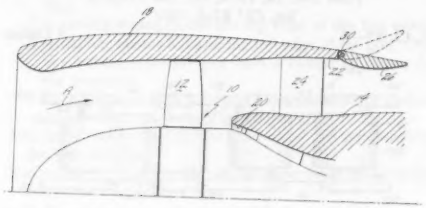
annular V-gutter means secured to the downstream end of the inner ring for providing a surface to which the pilot flame may attach.

3,931,708

VARIABLE FLAP FOR A VARIABLE PITCH DUCTED FAN PROPULSOR

David L. Motycka, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 11, 1973, Ser. No. 405,606
Int. Cl.² F02K *1/12, 3/06*
U.S. Cl. 60—226 A 4 Claims



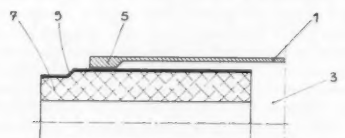
1. For a variable pitch ducted fan driven by a turbine type of power plant in which the duct surrounds and extends beyond the inlet of the power plant and the fan is movable from a positive to a negative pitch to reverse the flow of air in the duct, a variable flap at the exit end of the duct pivotally mounted aft of said inlet, said variable flap having an inwardly convex inner wall protruding into the duct to define a reduced diameter of the duct and a nozzle when said flap is in the normal positive pitch position and defining a substantially aerodynamically smooth surface for directing air from outside of said duct through the exit end into said inlet and said fan when in the reverse position.

3,931,709

METHOD OF LOADING A SOLID FUEL ROCKET ENGINE

Bernard Jean Felix Victor Doin; Robert Omer Emmanuel Grebert, and Yves Pierre Jouhaud, all of Saint Medard en Jalles, France, assignors to Societe Nationale des Poudres et Explosifs, France

Division of Ser. No. 335,766, Feb. 26, 1973, abandoned. This application Oct. 29, 1974, Ser. No. 518,578
Claims priority, application France, Mar. 3, 1972, 72.07377
Int. Cl.² F02K *9/04*; C06B *21/00*
U.S. Cl. 60—255 3 Claims



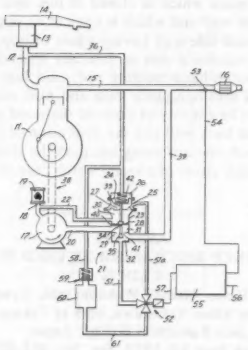
1. A method of introducing a block of solid propellant fuel into the combustion chamber of the body of a solid fuel rocket engine, said rocket engine being of uniform outer diameter, and comprising a cylindrical body portion, at least one cylindrical block of propellant fuel within said body portion, said body portion defining a cylindrical combustion chamber, means for attaching mechanical parts located within said body portion, said chamber comprising at least one portion of increased internal wall thickness at one end of said body portion, whereby said chamber has reduced cross section in the end of increased internal wall thickness, and an opening at the end of said reduced cross section for insertion of said cylindrical block of propellant fuel, said block having an end portion of reduced cross section, which comprises cooling the block of propellant fuel to such a temperature that its maximum cross-sectional dimension is less than the minimum dimension of said end of the chamber of reduced cross-section and rapidly introducing at this temperature, the block into the combustion chamber through said end of reduced cross-section.

3,931,710

METHOD AND INSTALLATION FOR THE PREDETERMINED ADDITION OF SECONDARY AIR FOR THE OPTIMUM COMBUSTION OF EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

Günter Härtel, Rosellen, Germany, assignor to Deutsche Vergaser GmbH & Co. Kommanditgesellschaft, Neuss, Germany

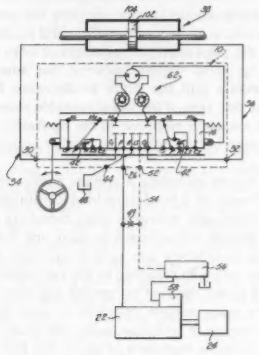
Filed May 1, 1973, Ser. No. 356,193
Claims priority, application Germany, Nov. 10, 1972, 2254961
Int. Cl.² F02B *75/10*
U.S. Cl. 60—276 2 Claims



1. An installation for the proportionate addition of secondary air employed in the optimum combustion and after-burning of the exhaust gases of an internal combustion engine, comprising; an engine-driven air pump control means for introducing predetermined quantities of said secondary air; means located externally of said control means being responsive to at least one of a plurality of engine operating conditions consisting of the pressure of the engine suction side, the engine exhaust gas back-pressure, engine rotational speed, exhaust gas oxygen content, and exhaust gas carbon monoxide content for regulating said control means; said control means including means for the withdrawal of a portion of the secondary air conveyed through said control means and conducting said withdrawn secondary air to the suction side of said air pump, said air pump returning said secondary air from the pressure side of said air pump to said control means; means for determining the rate of feed of the secondary air and the quantity of the air portion withdrawn from said control means to said air pump, said means including two spaced conical valve means controlling flow passages through said control means, said valve means being mounted on a common actuating control rod and being positioned so that, during an increase of the fed quantity of secondary air, the quantity of the withdrawn air portion is reduced, said actuating control rod for said conical valve means being rigidly connected to two spaced upper and lower membranes having unequal operative surfaces, said membranes defining therebetween a first con-

trol pressure chamber communicating with the exhaust gas back-pressure of said engine, and a second control pressure chamber located above the upper membrane communicating with the suction side pressure of said engine.

3,931,711
CONTROLLER ASSEMBLY
Jim Lee Rau, Lafayette, and Laurence L. Miller, West Lafayette, both of Ind., assignors to TRW Inc., Cleveland, Ohio
Filed Nov. 6, 1974, Ser. No. 521,209
Int. Cl.² F16H *39/46*
U.S. Cl. 60—445 **15 Claims**



1. A mechanism for effecting actuation of a vehicle steering motor to turn vehicle wheels, said mechanism being constructed to be in fluid communication with the steering motor and with a variable delivery fluid source having pressure-responsive means for effecting variations in the delivery of fluid from the source and the steering motor, said mechanism comprising,

a housing defining a valve chamber,

a valve member located in said valve chamber, said valve member having a neutral position and being movable therefrom to port fluid to said steering motor,

said housing having a control port for fluid connection to said pressure-responsive means,

a variable orifice formed between said valve member and said housing and communicating with said control port, and

means for positioning said valve member as a function of variations in the rate of movement of the input member and variations in the steering load to thereby vary the size of said orifice and the control pressure ported to said pressure-responsive means.

3,931,712
INTERNAL COMBUSTION ENGINE TURBOCHARGER PRESSURE CONTROL REGULATORS
Robert A. Keller, Huntington Beach, Calif., assignor to The Echlin Manufacturing Company, Branford, Conn.
Filed Oct. 15, 1974, Ser. No. 514,412
Int. Cl.² F02D *23/00*
U.S. Cl. 60—602 **15 Claims**

5. A differential pressure-control system, having remotely controllable biasing means, the control system being designed and adapted for controlling the output pressure for a supercharger by varying the amounts of the power source supplied to the supercharger, the control system comprising:

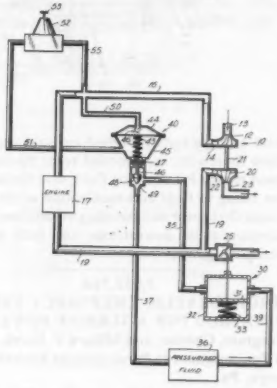
differential pressure-responsive means, comprising a displaceable member having opposing pressure surfaces, a first surface and a reference pressure surface, the member being displaceable when the pressure applied to the opposing surfaces differs by a predetermined differential value;

control means for regulating the amount of power source supplied to the supercharger;

linkage means, operatively connecting the displaceable member and the control means;

first pressure conducting means designed and adapted to place in fluid pressure connection, the first surface and the outlet from a supercharger, so as to apply against the first surface the pressure at the supercharger outlet;

reference pressure conducting means in fluid pressure connection with the reference pressure surface; and



an externally controllable pressure regulating means in fluid pressure connection with the reference pressure conducting means and designed and adapted to be in fluid pressure connection with the outlet from the supercharger, the regulating means being further designed and adapted to limit the maximum value of the pressure transmitted from the supercharger outlet via the regulator and the reference pressure conducting means to the reference pressure surface, whereby there is substantially no differential pressure between the opposing surfaces of the displaceable member until the aforesaid maximum reference pressure is reached, at which point a pressure differential develops, the control means receives a signal from the pressure-responsive means when the pressure differential exceeds the predetermined value;

thus, the absolute pressure at which the control means is activated is controlled by the pressure regulating means.

3,931,713
TURBINE WITH REGENERATION
Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042
Continuation-in-part of Ser. No. 405,628, Oct. 11, 1973. This application Dec. 30, 1974, Ser. No. 537,067
Int. Cl.² F01K *25/02;* **F02C** *1/04;* **F02G** *1/00*
U.S. Cl. 60—650 **6 Claims**

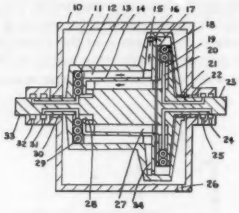
1. A turbine for generating power and comprising:

a. means for rotatably supporting first and second rotors;

b. First and second rotor shafts journalled in said support means for rotation;

c. first rotor means provided said first shaft for rotation therewith, said first rotor means having a first passageway for an outward bound first fluid, with said first passageway communicating at its downstream end with means for accelerating said first fluid forwardly in the direction of rotation of said first rotor means and for passing said first

fluid into said second rotor means, said first rotor means further having a second passageway for inbound first fluid in close proximity to said first passageway and in communication therewith near the downstream end of said second passageway, and heat exchanger means intermediate said first and second passageways for adding heat to said outward bound first fluid from said inward bound first fluid;



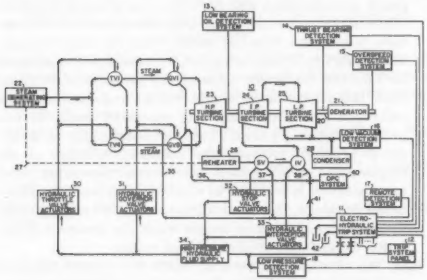
d. second rotor means mounted on said second shaft for rotation therewith, said second rotor having further passageway means for said first fluid, said further passageway means being in fluid communication at its upstream end with said first rotor accelerating means, and in fluid communication at its downstream end with said first rotor second passageway.

3,931,714

ELECTROHYDRAULIC EMERGENCY TRIP SYSTEM AND METHOD FOR A TURBINE POWER PLATE

Karl O. Jaegtnes, Chester, and Millard F. Smith, West Chester, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 6, 1974, Ser. No. 477,114
Int. Cl. F01k *13/02*
U.S. Cl. 60—660 **12 Claims**



1. An electro-hydraulic emergency trip system for a turbine power plant to close rapidly the steam inlet valves to the turbine in response to a predetermined contingency, comprising:

a plurality of steam inlet valves,

an operating mechanism for each steam inlet valve operative to close its associated valve in response to a predetermined decrease of fluid pressure in communication with such operating mechanism,

a source of fluid under pressure,

a first hydraulic means including a drain connecting operatively the source of fluid under pressure to the operating mechanism of each steam inlet valve to pressurize each operating mechanism sufficiently to render the steam inlet valves controllable to an open position at times when the drain is blocked,

first and second trip valve means each having a main portion and a pilot portion, said main portion having a movable member to block the flow of fluid through the valve at times when the main member is subjected at one side to a predetermined fluid pressure, said pilot portion having a movable pilot member electrically operable to one condition to decrease the fluid pressure at said one side of the movable main member to render such decrease effective to open the valve and electrically operable to another condition to maintain the predetermined fluid pressure,

second hydraulic means interconnecting the main portions of the first and second trip valve means to the first hydraulic means in parallel relationship to block the drain of the first hydraulic means at times only when the movable main members of both the first and second trip valve means is subjected to the predetermined fluid pressure,

third hydraulic means interconnecting the one side of the main movable members of both first and second trip valve means to the pilot movable members of both the first and second trip valve means between the source of fluid under pressure and the drain to decrease the pressure against the one side of the main movable member of both trip valve means in response to the operation of the pilot movable member of either the first or second trip valve means,

and circuit means including a voltage source responsive to the occurrence of a predetermined contingency to operate the electrically movable pilot members of both the first and second valve means to their one condition,

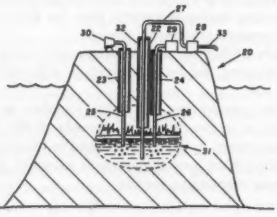
whereby the emergency trip system operates to close the steam inlet valves in response to the operation of the main portion of either the first or second trip valve means and said either main portion operates to open its associated trip valve means in response to the electrical operation of the pilot movable members of either the first and second trip valve means.

3,931,715

METHOD OF TRANSPORTING ICE STRUCTURE

John L. Fitch, and Lloyd G. Jones, both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed July 5, 1974, Ser. No. 486,251
Int. Cl.[2] E02D *19/04;* **F25C** *1/02*
U.S. Cl. 61—46.5 **8 Claims**



1. A method of transporting an ice island from a first offshore location to a second offshore location, said method comprising:

forming an internal cavity within said ice island of a size sufficient to provide the buoyancy necessary for said island to float on the water at said first offshore location, said internal cavity being formed within said structure by melting ice from the interior of said structure and removing the resulting water; and

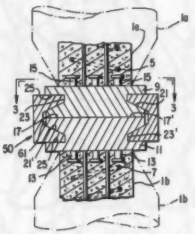
moving said island on the water from said first offshore location to said second offshore location.

3,931,716

PILE SPLICE FOR CONCRETE AND STEEL PILES OF VARIOUS CONFIGURATION

Donald Payne, 53 O. K. Ave., Harahan, La. 70123

Filed June 7, 1974, Ser. No. 477,278
Int. Cl.² E02D 5/34, 5/22
U.S. Cl. 61—53 19 Claims



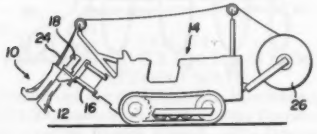
1. The method of forming a plurality of pile sections into an integrated piling assembly comprising the steps of casting an elongated pile section matrix having abutment plates of identical configuration and outwardly extending, sloping flange areas integrated in the matrix; manipulating said plates to dispose the outer surfaces thereof in a plane precisely normal to the longitudinal axis of the pile section; thereafter while on site, placing at least a pair of pile sections in end-to-end alignment with the abutment plates at one end of a pile section in abutment throughout its entire end face area with the abutment plate of the other of said pile sections; surrounding the outwardly extending, sloping flange areas of said abutment plates with a clamping collar having at least one discontinuous portion; closing said collar against the edges of said abutment plates by compression to reduce the span of the discontinuous portion by drawing the collar ends into closely adjacent but non-abutting relation and thereafter welding only said collar to close said discontinuous portion, without welding said abutment plates to each other or to said collar.

3,931,717

MULTIPLE CABLE CHUTE

Paul R. Schuck, Davenport, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Sept. 16, 1974, Ser. No. 506,669
Int. Cl.² E02F 5/02
U.S. Cl. 61—72.6 9 Claims



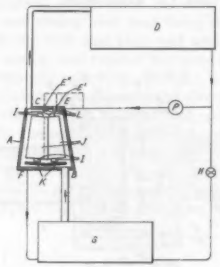
1. In a cable guiding chute assembly including a pair of spaced, generally parallel vertical sidewalls; a set of spaced end walls between and generally perpendicular to said sidewalls, said end walls defining a passageway to receive generally vertically oriented cables and to guide said cables into a generally horizontal orientation for placement in the ground; and a plurality of dividers positioned between said set of end walls and being generally perpendicular to said sidewalls to define a plurality of cable guiding conduits within said passageway, said dividers having arcuate sections for guiding and dispensing a plurality of cables into said horizontal orientation, the improvement of one of said end walls including a flange adjacent to one of said sidewalls, said flange extending generally parallel to said one sidewall, a plurality of connector clips carried by said one sidewall and receiving said flange for releaseably interconnecting said one side wall to said one end wall, and a locking means carried by the other of said end walls for releaseably engaging a latch carried by said one sidewall, wherein said one sidewall may be removed from the chute assembly to expose the conduits to enable lateral removal, insertion or replacement of a plurality of cables.

3,931,718

REFRIGERANT SCREW COMPRESSION WITH LIQUID REFRIGERANT INJECTION

Geoffrey Gordon Haselden, Leeds, England, assignor to Hall-Thermotank Products Ltd., London, England

Continuation of Ser. No. 134,591, April 16, 1971, abandoned.
This application July 17, 1973, Ser. No. 380,115
Claims priority, application United Kingdom, Apr. 16, 1970, 18289/70
Int. Cl.² F25B 1/10
U.S. Cl. 62—505 12 Claims



11. A refrigeration system according to claim 1, wherein the inside of the compressor casing is roughened to retain liquid refrigerant.

3,931,719

JEWELRY COMPONENT HAVING MOUNTED STONES CONNECTED BY DEFORMABLE WEBS

Kurt Schwab, Innsbruck, Austria, assignor to D. Swarovski & Co., Glasschleiferei, Austria

Filed Apr. 27, 1973, Ser. No. 355,361
Claims priority, application Austria, May 3, 1972, 3852/72; Mar. 29, 1973, 2781/73
Int. Cl.² A44C 15/00, 27/00
U.S. Cl. 63—28 1 Claim

1. Jewel-studded components comprising a thin screen-like planar holder, said holder comprising at least two rows of rings, said rows being disposed in laterally spaced relation to one another, each said row having a plurality of rings disposed in spaced relation longitudinally of said row, and connecting means consisting of webs integrally interconnecting each said ring with at least one other of said rings, stones each having a separating plane with a front surface extending outwardly from one side of the separating plane and a back surface extending outwardly from the opposite side of the separating plane beyond said rings, and the back surface of each stone being secured in one of said rings, the thickness of said holder being only a samll fraction of the height of the back surface of each said stone measured outwardly from the separating plane, and the size and shape of said rings being adapted to the

size and shape of said stones, said webs comprising first webs each connecting adjacent said rings of each of said respective rows, said first webs disposed in longitudinal alignment with each other in the respective row, and second webs extending obliquely of the longitudinal direction of said first webs and interconnecting adjacent said rings of different said rows so that one said first web and one said second web each connected to one said ring extend therefrom each to a said ring in a different said row, said webs being permanently deformable whereby the dimension of said component can be increased or decreased in a direction transverse to said longitudinal direction.

3,931,720

SELF-ALIGNING COUPLING

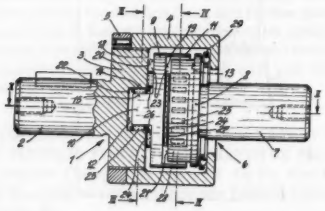
Rolf Bührer, Seestrasse 192/194, 8810 Horgen (Kt. Zurich), Switzerland

Filed Dec. 5, 1973, Ser. No. 422,101

Claims priority, application Switzerland, Feb. 7, 1973, 1851/73

Int. Cl.² F16D *3/04*

U.S. Cl. 64—31 **6 Claims**



1. A self-aligning coupling comprising a driving part and a driven part, said parts having grooves oriented at right angles to one another with planar flanks parallel to the axis of the respective part and planar faces perpendicular to said axes;

a cross-disk member received between said parts and having a pair of prismatic ledges oriented at right angles to one another and respectively received in said grooves, said ledges having planar flanks each parallel to and spacedly juxtaposed with a flank of the respective groove, said member having planar faces adjoining said ledges and spacedly juxtaposed with and parallel to a respective face of one of said parts whereby each flank of a groove and an adjoining face of one of said parts is paired with a juxtaposed flank of a respective ledge and an adjoining face of said member;

and a respective bearing element comprising a linearly extending L-profile and linearly movable cage, with legs lying between the paired faces and flanks, disposed between said parts and said members, each of said bearing elements being formed with an array of a multiplicity of thrust needle bearings in each leg engaging the paired surfaces and paired flanks with the axes of the needle bearings of one leg of each element orthogonal to the axes of the needle bearings of the other leg thereof.

3,931,721

WARP KNITTED ELASTIC FABRIC

Thomas E. Adamson, Shillington, Pa., assignor to VF Corporation, Reading, Pa.

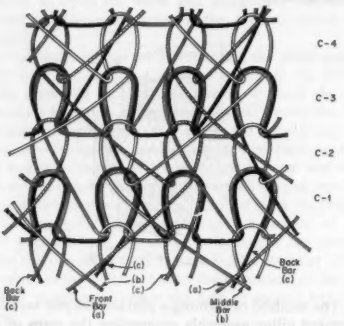
Filed July 22, 1974, Ser. No. 490,342

Int. Cl.² D04B *21/00*

U.S. Cl. 66—195 **5 Claims**

1. A warp knitted elastic fabric having a soft hand, lightweight opacity, streak-free uniforming and low-modulus human figure-control type stretch in one direction and high-modulus form-fitting comfort stretch in the other direction at right angles to said first direction comprising

a. a plurality of elastic threads and a plurality of non-elastic threads forming alternate elastic courses and intervening non-elastic courses,



b. a plurality of elastic threads arranged in a solid warp of elastic threads and formed into a plurality of adjacent connected wales in alternate elastic courses only, when at least half of the non-elastic threads are floating, and

c. wherein on the alternate elastic courses when the elastic threads are knitting each thread forms two stitches which are components of two adjacent wales in the same course.

3,931,722

APPARATUS FOR LIQUID TREATMENT OF A CLOTH BAND OF AN ENDLESS FORM

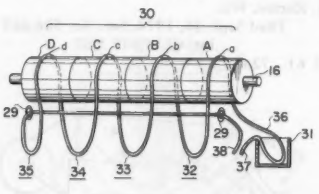
Narihiro Isoda, Fukui, Japan, assignor to Suntex Limited, Fukui, Japan

Filed May 14, 1973, Ser. No. 360,302

Claims priority, application Japan, May 31, 1972, 47-54192

Int. Cl.² D06B *3/24*

U.S. Cl. 68—176 **2 Claims**

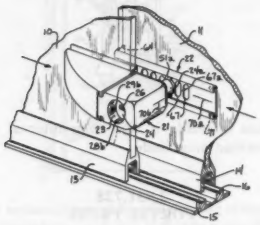


1. An apparatus for liquid treatment of a lengthy woven or knitted cloth band for scouring, dyeing and desizing of cloths, comprising a plurality of drums rotatably mounted on a common shaft about which drums said cloth band is helically wound, a treating tub beneath said drums for said treatment, means for rotating said drums at progressively reduced peripheral speeds from one end to the other in order to depend each helical part of the cloth band downwardly from the drums at a uniform length and means for rotating drums at an equal speed thereby circulating the cloth band through the treating liquid in said tub to apply the desired treatment, said means for rotating the drums at an equal speed having a relationship with the means for rotating the drums such that the equal speed takes place after the results of the reduced peripheral speeds are achieved.

3,931,723
LOCK FOR SLIDING CLOSURE PANELS

Thomas D. Kurtz, 1101 First Ave., Rock Falls, Ill. 61071

Filed Apr. 3, 1975, Ser. No. 564,612
Int. Cl.² E05B 65/08
U.S. Cl. 70—14 28 Claims



1. A lock for use on outer and inner by-passing type closure panels respectively slidable endwise on outer and inner parallel tracks into and out of a closed position with one end of each the outer and inner panels in spaced overlapping relation, said lock being adapted to lock the panels in a closed position and comprising a lock housing having a lock plug mounted therein for axial sliding and rotary movement, a mounting plate rigid with the housing and extending laterally therefrom with a flat attaching face on one side of the mounting plate disposed in a plane perpendicular to the plug axis, adhesive means on said attaching face for adhesively securing said mounting plate to the inner side of the outer panel with the plug offset from said one end of the outer panel and extending perpendicular to the plane of the outer panel, a keeper plate having a flat attaching face on one side and adhesive means on said flat attaching face for adhesively securing the keeper plate to the outer side of the inner panel adjacent said one end thereof, said plug having a keyway and key operated means controlling rotation of said plug, said plug being axially movable from a retracted position in which the forward end of the plug is adjacent the housing to an extended position in which the forward end of the plug is adjacent said keeper plate and said plug being angularly movable between first and second angular positions under the control of said key, and latch means on the forward end of said plug and keeper means on the keeper plate operative to engage said latch means when the plug is extended and rotated to said second position to lock the plug against retraction to said first position and to lock said keeper plate against movement in the direction crosswise of the plug.

3,931,724
PLUG-RETAINING DEVICE FOR USE IN PIERCING AND PLUGGING MILLS

Mark Grigorievich Berdyansky, ulitsa Dzerzhinskogo, 24, kv. 17; Zarislav Zakharovich Khodak, ulitsa Dzerzhinskogo, 24, kv. 22; Vladimir Fomich Veevnik, ulitsa Orlovskaya, 24-a, kv. 21; Vladimir Semenovich Dovgan, ulitsa Vozdukhoflotskaya, 1, kv. 8; Vladimir Porfirievich Bashkatov, ulitsa Kosiora, 12, kv. 40; Vladimir Khrisanfovich Kasyan, ulitsa Naberezhnaya, 1, kv. 132; Konstantin Fedorovich Bezkrovny, prospekt Pushkina, 25/27, kv. 39, and Lev Izrailevich Tsekhnovich, ulitsa Kirova, 8, kv. 8, all of Dnepropetrovsk, U.S.S.R.

Filed Aug. 14, 1974, Ser. No. 497,498
Int. Cl.² B21B 25/02
U.S. Cl. 72—97 1 Claim

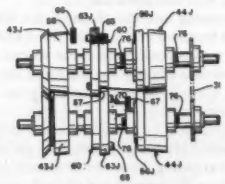
1. A plug-retaining device for use in a piercing and plugging mill for producing hollow cylindrical pipe billets, comprising, in combination: a rod with a plug, said rod being set up along the rolling axis of the mill, reciprocable therealong, and having axial slots about its circumference; a gear arranged on the rolling axis, through which gear said rod and said plug pass, for keeping said rod from axial displacements under the effect of the load arising during the piercing and plugging of the billets; said gear including a fixed thrust bearing, a revolving casing enclosed within said bearing, with a portion of the internal surface of said casing forming a working cone that faces said plug with its base, a lock for securing said rod with said plug in said cone at the moment of the piercing and plugging, said lock being set up on said rod in the rolling direction behind said bearing and provided with a wedge longitudinally spring-biased to said rod and made as a cone facing said plug with its apex, and cams arranged in said slots, floating in radial direc-

tions, positively encompassing said cone, to fix said rod in its working position, to preclude the axial displacements with respect to said casing; said gear being fitted with means for shifting said rod with said plug, and with a retainer disposed within said casing, said retainer being made as a spring-biased bush for engaging said lock; whereby, as said wedge is displaced in relation to said rod in the direction opposite to the rolling direction, at the moment said rod interacts with said retainer, said cams mate with their external surfaces with said cone, thereby blocking said rod within said casing; while, as said wedge moves in the rolling direction, said external surfaces are brought out of engagement with said cone, thereby enabling said rod with said plug to return to its initial position.

3,931,725
MOBILE MACHINE FOR PRODUCING METAL SIDING

Robert E. Yon, Middletown, Pa., assignor to Specialty Design & Mfg. Co., Reading, Pa.

Filed Apr. 16, 1975, Ser. No. 568,696
Int. Cl.² B21D 5/08
U.S. Cl. 72—181 8 Claims



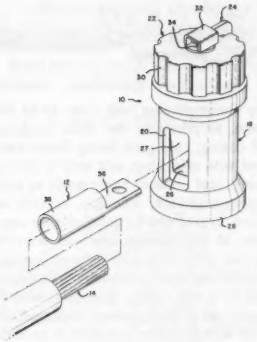
1. A machine for forming a strip of metallic stock into a siding strip of either a first or a second cross sectional configuration, with the siding strips of both configurations having first and second marginal portions, with the first marginal portion shaped to define a butt, and both marginal portions shaped to define siding strip interconnecting means, and said siding strip of said second configuration additionally having an intermediate butt, said machine comprising a succession of pairs of opposed strip-shaping means, shafts supporting said strip-shaping means for rotation therewith, and means for rotating said shafts, said pairs of opposed strip-shaping means each comprising first and second spaced-apart roller means having shaping elements for forming said above-defined shapes of said first and second marginal portions, and certain of said succession of pairs of opposed strip-shaping means each including additional roller means having readily attachable and detachable shaping elements for forming, when attached, said intermediate butt.

3,931,726

PROPELLANT-DRIVEN DEVICE FOR CRIMPING LARGE SIZE WIRE AND TERMINALS

Daniel Baker Grubb, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 21, 1975, Ser. No. 542,731
Int. Cl.[2] B21J *15/24*
U.S. Cl. 72—430 1 Claim



1. A propellant-driven device for crimping a terminal into encompassing engagement with a wire, which comprises:
a. a housing having an elongated chamber with a first and a second end;
b. a fixed die positioned at the first end of the chamber;
c. a movable die slidingly positioned in the chamber which cooperates with the fixed die;
d. a lateral opening into the chamber for allowing the positioning of a terminal between the fixed and movable dies;
e. propellant means positioned at the second end for propelling the movable die toward the fixed die;
f. removable closure means for closing the second end of the chamber;
g. detonating means for detonating the propellant means, said detonating means positioned in the closure means;
h. a passage extending from the chamber adjacent the second end with a gas release pin slidingly positioned therein and adapted to removably seal the passage; and
i. safety means pivotally connected to the closure means so that as it is pivoted outwardly it forces the gas release pin into sealing engagement in the passage.

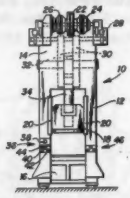
3,931,727

METHOD AND SYSTEM FOR DETECTING BRAKE WEAR IN A METAL FORMING MACHINE

Kurt K. Luenser, De Soto, Tex., assignor to Verson Allsteel Press Company, Dallas, Tex.

Filed Sept. 9, 1974, Ser. No. 504,363
Int. Cl.[2] B21J *7/46*
U.S. Cl. 72—444 20 Claims

1. A safety system for a machine having a work producing member which is movable by a drive system and which is stopped by a brake comprising:
means responsive to the drive system for detecting the time interval between the time of energization of the brake and the time that the work producing member stops,
means for comparing said time interval with a predetermined magnitude, and



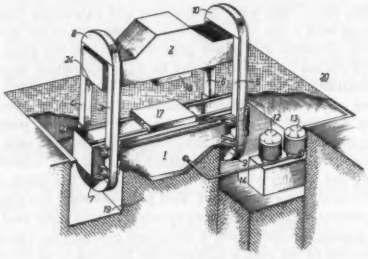
alarm means operable if said time interval exceeds the predetermined magnitude.

3,931,728

PORTAL PRESS

Sten Trolle, Ystad, Sweden, assignor to AB Carbox, Ystad, Sweden

Filed Feb. 14, 1974, Ser. No. 442,416
Claims priority, application Sweden, Feb. 27, 1973, 7302712
Int. Cl.[2] B21J *13/04*
U.S. Cl. 72—455 4 Claims



1. An hydraulic press for heavy workpieces, comprising:
a frame including two spaced yokes (1, 2); and frame units, each frame unit including a pair of columns (3, 4 and 5, 6) disposed at the ends of the yoke and spacing the yokes apart, said pairs of columns (3, 4 and 5, 6) straddling the ends of the yokes (1, 2); and upper and lower crossbeams (7-10) interconnecting the columns of a pair of columns; and
hydraulic cylinders (15, 16) carried by the frame and operatively coupled to at least one of the yokes (1, 2) to effect a working stroke of the press by relatively moving the yokes (1, 2) towards and away from each other;
at least one of the yokes (2) being provided with tool carrying means to carry a tool which is displaceable beyond the yoke in the longitudinal direction of the at least one yoke (2) so that said press is usable as a gap press.

3,931,729

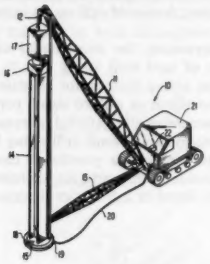
DYNAMIC FORCE MEASURING INSTRUMENT FOR FOUNDATION PILE AND CASING

Leonard L. Frederick, 15 Crestview Terrace, Whippany, N.J. 07981

Continuation of Ser. No. 233,651, March 10, 1972, abandoned. This application Dec. 27, 1973, Ser. No. 428,675
Int. Cl. G01L *1/12*
U.S. Cl. 73—11 6 Claims

1. In a pile driving apparatus having a hammer for driving a pile formed at least in part of magnetostrictive material, the improvement comprising: sensing means positioned in close proximity to said pile, proximate said magnetostrictive mate-

rial, supported independently of said pile and spaced therefrom for sensing magnetostrictive effect in said pile as a measure of the force of longitudinal blows applied to the top of

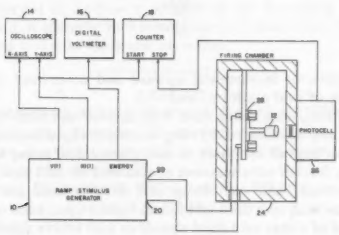


said pile; and means coupled to said sensing means for receiving a signal therefrom and for indicating the force of said blows to said pile.

3,931,730
RAMP CURRENT APPARATUS AND METHOD OF SENSITIVITY TESTING

David R. Dreitzler, Huntsville, and Charles R. Moore, Hazel Green, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 23, 1974, Ser. No. 535,324
Int. Cl.² G01N *33/22*
U.S. Cl. 73—35 **6 Claims**



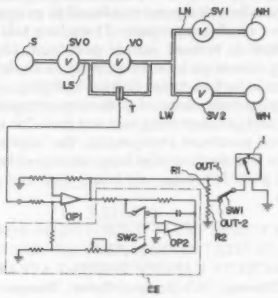
1. Apparatus for sensitivity testing electroexplosive devices, comprising: a ramp stimulus generator for providing a variable ramp current output for coupling to said electroexplosive device; an oscilloscope coupled to said ramp stimulus generator and responsive to the voltage and current coupled to said electroexplosive device to provide an x–y plot thereof; a counter coupled to said ramp stimulus generator for activation when current is applied to said electroexplosive device and for indicating the time in which current is supplied to said electroexplosive device; and a light sensor adjacent said electroexplosive device having an output coupled to said counter for stopping said counter when said electroexplosive fires.

3,931,731
FLUX METER

Akira Fukuda, 2-22-8 Kasuga-cho, Nerima, Tokyo, Japan

Filed May 22, 1974, Ser. No. 472,399
Claims priority, application Japan, May 25, 1973, 48-59097
Int. Cl.² G01M *3/16*
U.S. Cl. 73—40 **1 Claim**

1. A flux meter which comprises a main pipe line having an end connected to a hydraulic pressure source and extending through an orifice valve, another end of said main pipe line branching off to a first branch line extending through a first electromagnetic valve and having an end for connecting to a work to be tested, a differential pressure transducer having two inlets for connecting to differential pressure means, a said inlet of said transducer being connected to said main pipe line orifice valve inlet side and another inlet of said transducer being connected to said main line orifice valve outlet side, a DC amplifier, an input terminal of said DC amplifier being connected to said differential pressure transducer output terminal, an output elimination circuit connected to said DC amplifier for the elimination of said DC amplifier outputs, a

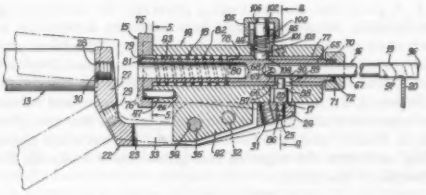


first output terminal for supplying a relatively large value with respect to said DC amplifier output, a second output terminal for supplying a relatively small value with respect to said DC amplifier output, said last-mentioned output being of a value equal to said first-mentioned output, an indicator having a scale indicating from a negative to a positive value, and a change-over switch for changing said indicator input terminal over from said first and second output terminals.

3,931,732
SHARP EDGE TESTER

Eugene von Heitlinger, Chicago, Ill., assignor to Schwinn Bicycle Company, Chicago, Ill.

Filed Oct. 24, 1974, Ser. No. 517,464
Int. Cl.² G01N *19/00*
U.S. Cl. 73—104 **12 Claims**



1. A tool for testing edge sharpness by moving standard test material over a test edge under predetermined velocity and engagement forces comprising: rotatably supported barrel means, means driven by said barrel means having a portion for supporting the test material in engagement with the test edge, motor means for driving said barrel and driven means at predetermined velocity, latch means holding said barrel means against rotation, and means operably responsive to predetermined engagement force between the test material and test edge for automatically operating said latch means to release said barrel means to the driving action of said motor means whereby cutting of said test material by said test edge establishes the presence of edge sharpness exceeding a predetermined safe value.

3,931,733

METHOD AND MEANS OF ACCELERATING REMOVAL OF BACKGROUND ENTRAPMENTS IN THE INSPECTION PENETRANT PROCESS

James R. Alburger, 5007 Hillard Ave., La Canada, Calif. 91011

Filed Dec. 16, 1974, Ser. No. 532,830
Int. Cl.² G01N *19/08*
U.S. Cl. 73—104 5 Claims

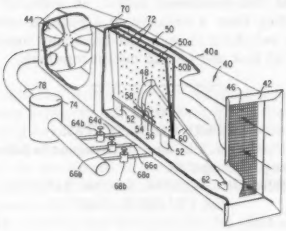
1. In an inspection penetrant process including the steps of (1) applying a dyed liquid water-removable penetrant to test parts so as to allow said penetrant liquid to penetrate into any surface flaws which are present, (2) washing said test parts in an initial wash to remove surface penetrant, (3) continuing the washing operation in a finish wash to deplete penetrant entrapments in surface micro-flaws, (4) drying said test parts, (5) developing indications of penetrant entrapments in surface flaws, and (6) inspecting said test parts for visual indications of dyed penetrant entrapments, the improvement consisting of the introduction of at least one step of interim-drying of said test parts following said initial wash and prior to said finish wash.

3,931,734

PARACHUTE CANOPY TESTING APPARATUS

Viggo G. Dereng, 702 Juniper Drive, Newport News, Va. 23601

Filed Feb. 6, 1974, Ser. No. 440,004
Int. Cl.² G01M *9/00*
U.S. Cl. 73—147 9 Claims



1. A parachute canopy testing apparatus for investigating the dynamic behavior of parachute canopies comprising at least one parachute gore, means for directing a fluid flow past said gore, means comprising first and second spaced splitter plates, positioned parallel to said flow and between which said flow passes, for receiving said gore therebetween, and means for suspending said gore between said plates so that said gore can be filled by said fluid flow, the spacing between said plates being such that the edges of said gore form a seal with the sidewalls of the plates.

3,931,735

METHODS AND APPARATUS FOR MEASURING THE RATE OF PENETRATION IN WELL DRILLING FROM FLOATING PLATFORMS

Jean Hubert Guigmard, Sainte Mesme, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

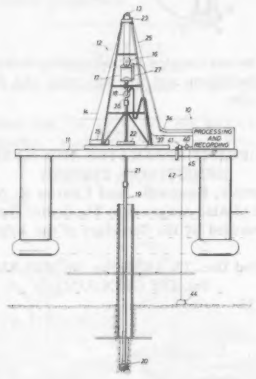
Filed Dec. 9, 1974, Ser. No. 530,886
Claims priority, application France, Jan. 23, 1974, 74.02180
Int. Cl.² E21B *47/00*
U.S. Cl. 73—151.5 22 Claims

1. A method for determining at least one function representative of the penetration into earth formations of a drill bit suspended from a drill string carried by a floating platform and disposed in a borehole, comprising the steps of:

successively determining the incremental lengths of said drill string moved into said borehole from said platform while said drill bit is drilling into said earth formations for deriving a first signal proportional to successive increases in the overall length of said drill string in relation to said platform;

successively determining the incremental changes in the overall length of said drill string due to variations in tensional forces acting thereon for alternatively deriving either a second signal or a third signal respectively proportional to successive elongations! increases or contractional decreases in said overall drill string length;

successively determining the positional changes of said platform in relation to the earth for alternatively deriving either a fourth signal or a fifth signal respectively repre-



sentative of incremental upward and downward movements of said platform; and

alternatively combining said first, second and fifth signals with one another for deriving an output signal representative of overall increases in said overall drill string length upon further advancement of said drill bit into said earth formations and combining said first, second and fifth signals with said third and fourth signals upon each occurrence of either said third signals or said fourth signals for selectively discontinuing further transmission of said output signal and then algebraically summing said combined signals only so long as the summation of further length increases respectively represented by subsequently occurring first, second and fifth signals is less than the summation of further length decreases represented by subsequently-occurring third and fourth signals.

3,931,736

IMPROVED FLUID FLOW SENSOR CONFIGURATION

John Aaron Olmstead, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 28, 1974, Ser. No. 484,092
Int. Cl.² G01F *1/68*
U.S. Cl. 73—204 7 Claims

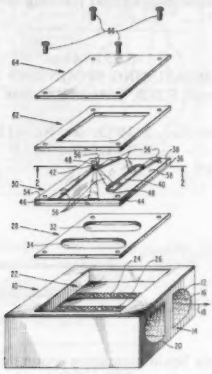
1. A fluid flow sensor configuration comprising:

a conduit adapted to contain a fluid, said conduit including a live-flow channel and a dead-flow channel,

a first electrical element and a second electrical element positioned to be adjacent to and in thermal contact with said fluid respectively in said dead-flow channel and said live-flow channel of said conduit, said first and said second electrical elements, in combination with additional circuitry, adapted to sense the flow of said fluid in said live-flow channel,

a thin membrane of thermally conductive material positioned to be between said fluid and said electrical ele-

ments and having a first surface thereof adjacent to and in thermal contact with both of said electrical elements, said membrane having a thickness of approximately 250 micrometers or less and a thermal conductivity of approximately 0.08 cal/cm—sec°C or less in order to minimize the lateral transfer of heat throughout said membrane



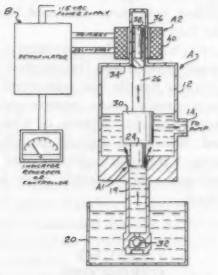
while keeping said electrical elements thermally coupled to said fluid, and

means for supporting a second surface of said membrane adjacent to and as a portion of the boundary of said conduit whereby said membrane is disposed between said fluid and said electrical elements.

3,931,737
PULSATING LIQUID FLOW TRANSMITTER

William Collins Conkling, Essex Fells, and Joseph Thomas Weber, Jr., Clark, both of N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed July 12, 1974, Ser. No. 488,098
Int. Cl.² G01F 1/24
U.S. Cl. 73—209 11 Claims



1. A pulsating liquid flow transmitter comprising:

a. a housing for coupling to a line through which liquid is pumped, said housing including a tapered tubular orifice therein and a float axially displaceable in said tapered orifice in response to the rate of flow of liquid therethrough;

b. sensing means for monitoring the displacement of said float and electrically delivering an A.C. output signal proportional to the displacement, said sensing means comprising a linear variable differential transformer having an armature moveable with said float and having a primary winding thereof coupled to an oscillator;

c. means for demodulating said A.C. output signal and having a D.C. milliampere output which can be transmitted as a continuous non-inferential measurement proportional to flow, said means for demodulating said A.C. output signal further comprising:

i. an A.C. amplifier;

ii. a rectifier for providing a pulsed D.C. output;

iii. a large time constant RC network for averaging out the pulsed response; and

iv. a voltage to current converter including a Darlington circuit and a current sensing resistor; and

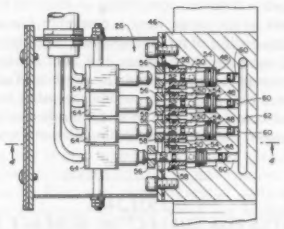
d. a light emitting diode in the base of said Darlington circuit for simultaneously preventing the output signal from exceeding the flow proportional capacity of any chosen output loop instrumentation and providing local indication of overload conditions from light emitted by the diode;

wherein said current sensing resistor is an emitter resistor.

3,931,738
DEVICE FOR MONITORING FLUID PRESSURE IN MECHANISMS SUCH AS HYDROSTATIC FLUID BEARINGS

Elpidifor Paramonoff, Los Angeles, and Frederick C. Olsen, Huntington Beach, both of Calif., assignors to Standun, Inc., Compton, Calif.

Division of Ser. No. 397,613, Sept. 17, 1973. This application Sept. 26, 1974, Ser. No. 509,650
Int. Cl.² G01L 7/16
U.S. Cl. 73—389 6 Claims



1. In a fluid pressure monitoring device for monitoring pressure of operating fluid of a machine and the like, the combination of: a housing; a main fluid chamber formed in said housing; a plunger in said main fluid chamber reciprocal between frist and second positions; operating fluid supply means communicating into said main fluid chamber and directing operating fluid against said plunger tending to urge said plunger toward said first position, said operating fluid normally being under a pressure above a predetermined minimum operating pressure exerting at least a part of a minimum total pressure force against said plunger retaining said plunger in said first position; monitoring pressure means operably connected into said housing and to said plunger exerting a monitoring total pressure force against said plunger slightly less than said minimum total pressure force tending to urge said plunger toward said second position, said monitoring pressure means moving said plunger toward said second position when said pressure of said operating fluid drops below said predetermined minimum operating pressure; said monitoring pressure means including monitoring fluid under pressure operably connected into said housing exerting a certain part of said monitoring total pressure force against said plunger tending to urge said plunger toward said second position, a monitoring fluid outlet sealed off by said plunger when said plunger is in said first position and opened into communication with said monitoring fluid during movement of said

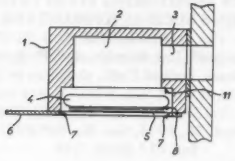
plunger from said first toward said second position, said monitoring fluid outlet when opened permitting flow of monitoring fluid therethrough; sensing means for sensing said plunger movement from said first toward said second position including detecting means operably connected to said monitoring fluid and detecting opening of said monitoring fluid outlet; by-pass means operably connected to said main fluid chamber for directing a certain portion of said operating fluid from said main fluid chamber when open, said by-pass means being closed when said plunger is in said first position and being opened during movement of said plunger from said first position toward said second position.

3,931,739

NEGATIVE PRESSURE DETECTOR

Jean Mourier, Savigny-sur-Orge, France, assignor to Benson, Creteil Val-de-Marne, France

Filed Aug. 13, 1974, Ser. No. 495,892
Int. Cl.² G01L 9/12
U.S. Cl. 73—398 C 5 Claims



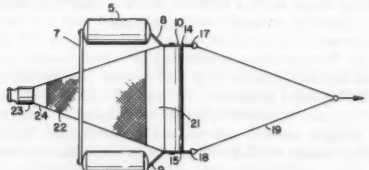
1. A negative detector comprising an element floating in air which forms at the same time a detection element and the moving plate or disc of an air capacitor, a chamber having its lower end vented and its upper end communicating with a negative pressure source, a fixed disc or plate of said capacitor being located at the lower end of said chamber and said floating element being contained in said chamber and providing a leakage section between said floating element and a chamber wall.

3,931,740

APPARATUS FOR COLLECTING SURFACE PARTICLE ON BODY OF WATER

Lyle Carter, 1903 33rd Ave., Oakland, Calif. 94601

Continuation-in-part of Ser. No. 302,215, Oct. 30, 1972, Pat. No. 3,811,325. This application Feb. 6, 1974, Ser. No. 440,171. The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.
Int. Cl.² G01N 1/12
U.S. Cl. 73—425.4 R 19 Claims



1. A water-quality sampling device for collecting surface floatage from a body of water comprising:

towing means for moving said device on said body of water in a predetermined direction;

laterally-spaced tracking means for maintaining said device in alignment in said predetermined direction; and

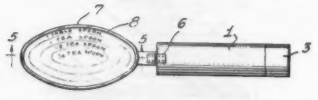
collecting means for removing said surface floatage from said surface water, said collecting means comprising intake opening means opening toward said predetermined direction for receiving oncoming surface water and a net having a forward opening extending for substantially the width of said device and disposed between said tracking means and having a smaller rear opening terminating in a sampler means, said sampler means being disposed rearwardly of said tracking means.

3,931,741

COMBINED MEASURING SPOON AND RECEPTACLE

Jovanna Ceccarelli, F.D.R. Station, P.O. Box 1564, New York, N.Y. 10022

Filed Nov. 2, 1973, Ser. No. 412,201
Int. Cl.² G01F 19/00
U.S. Cl. 73—427 1 Claim



1. An accurate liquid measuring spoon device for medicine dosing and the like comprising a bowl and a handle, said bowl being narrow and elongated and said bowl comprises a spoon having a measuring portion impressed with indicating lines substantially concentric to each other, said measuring portion delimiting the quantity of a medicine dose at one fourth teaspoon, one-half teaspoon, 1 teaspoon and 1 tablespoon, an additional margin is provided between the tablespoon indicating line and the terminal edge of the bowl, to function as a safety zone to prevent spillage,

said bowl of said spoon connected to said handle by a stem at the end opposite the closure end of said handle, said handle consisting of a hollow elongated member having the same depth as said bowl, the bottom center portions of the bowl and handle of said spoon being polished to prevent rocking, said hollow handle serving as a horizontal leveling device for said bowl of said spoon when lying in a plane on a flat surface in an open condition, the closure end of said handle openable by means of a screw cap permitting access to said hollow member,

a tight fitting friction hinge fastened to said stem of said spoon connecting said bowl and said handle to permit said handle to fold over;

said bowl for carrying, thereby providing a compact unit, that can be easily stored and transported,

said hollow container handle and said screw cap serving to enclose a permanently made, removeable, transparent, graduated measuring vial therein, or which alternatively could be used, selectively contain liquids, medicated or otherwise, or such items as capsules, pills, lozenges, thermometer and any other suitable item for storage, for carrying or both.

3,931,742

GYROSCOPE

Orie W. Shirley, Estacada, Oreg., assignor to Datron Systems, Inc., Thomaston, Conn.

Filed Aug. 13, 1973, Ser. No. 387,691
Int. Cl.² G01C 19/26
U.S. Cl. 74—5.7 21 Claims

1. In a gyroscope,

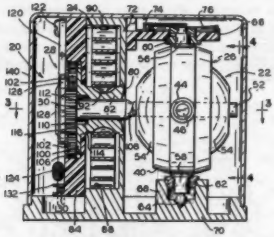
gyroscopic rotor means of a predetermined light weight,

gimbal means mounting the rotor means for rotational movement,

spring motor drive means including a spring adapted to be wound,

and coupling means for releasably coupling said spring motor drive means in driving relation to said rotor means for bringing said rotor means up to a desired speed,

said coupling means including step-up gearing means for rotating said rotor means at a speed greater than the



unwinding speed of said spring so that the rotor means has a high angular momentum despite its lightness in weight, the weight of said rotor means being lighter than would be required to attain a given angular momentum without said step-up gearing.

3,931,743

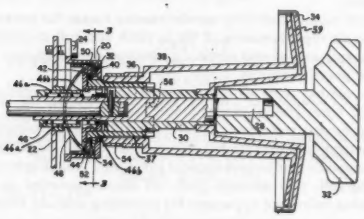
COMPACT SPEED REDUCTION MECHANISM FOR A UHF INDICATOR DIAL

Alarico A. Valdettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed Nov. 20, 1974, Ser. No. 525,354

Int. Cl.² F16H *35/18*

U.S. Cl. 74—10.54 **11 Claims**



1. A tuning system comprising:

a tuner having a selector shaft, rotation of which is effective to tune said tuner over a predetermined band of frequencies, a plurality of revolutions of said selector shaft being required to tune said tuner over said predetermined band;

a rotatable tuning indicator;

means interconnecting said selector shaft and said tuning indicator, said interconnecting means including

a circular rigid spline member fixedly attached to said tuner, said rigid spline member having a first plurality of teeth circularly disposed on a radially extending surface of said rigid spline member,

a circular flexible spline member having a second plurality of teeth greater in number than said first plurality of teeth circularly disposed on a radially extending surface of said flexible spline member and opposing said first plurality of teeth,

a wave generating member engaging said flexible spline member, said wave generating member being biased to urge at least one of said second plurality of teeth into engagement with one of said first plurality of teeth, said wave generating member being affixed to said selector shaft for rotation therewith to thereby successively bring different ones of said first and second pluralities of teeth into engagement thereby causing said flexible spline member to rotate at a predetermined rate slower than the rotation of said selector shaft, and

means mechanically coupling said flexible spline member to said tuning indicator dial for causing said tuning indicator dial to rotate in synchronism with said flexible spline member.

3,931,744

HAMMER-DRILL

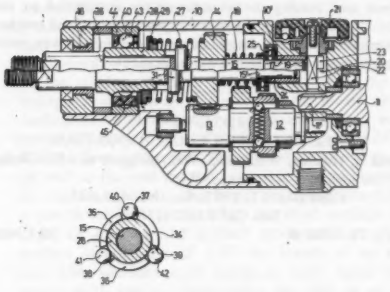
Steffen Wünsch, Dettenhausen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 3, 1974, Ser. No. 476,139

Claims priority, application Germany, June 5, 1973, 2328462

Int. Cl.² F16H *21/00*

U.S. Cl. 74—22 **12 Claims**



1. A hammer drill, comprising a housing; a spindle mounted in said housing for rotation and axial reciprocation with respect thereto; first biasing means urging said spindle in one axial direction outwardly of said housing; an impact member mounted on said spindle for rotation with and limited axial displacement relative to the same and having an outer circumferential surface coaxial with said spindle; second biasing means urging said impact member also in said one axial direction; cam means connected to said impact member and projecting outwardly from said circumferential surface thereof, and including a plurality of cams which are inclined axially and circumferentially of said impact member and separated from one another in the circumferential direction by interruptions extending all the way to said circumferential surface of said impact member; a fixedly mounted guide ring surrounding said impact member and having a race; a number of roller bodies which corresponds to the number of said cams and each in rolling contact with said race, said circumferential surface and a respective of said cams; and a cage for maintaining said roller bodies at equi-angular distances about said circumferential surface.

3,931,745

TENSIONING DEVICE FOR A FLEXIBLE DRIVE ELEMENT

Dale Rudolph Dobberpuhl, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

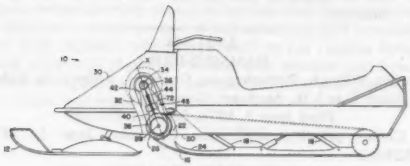
Filed Oct. 29, 1974, Ser. No. 518,586

Int. Cl.² F16H *7/12, 7/10*

U.S. Cl. 74—242.11 S **6 Claims**

1. In combination with a drive of a type including a support on which generally cylindrical drive and driven members of different diameters are mounted for rotation about parallel axes and a flexible drive element trained over the drive and driven members so as to form first and second runs located at opposite sides of a line of centers passing through said axes, a tensioning device comprising: a tensioning member located between said drive and driven members and including a center portion located between the first and second runs and joining first and second abutment surface means, which are respec-

tively engaged with outer periphery locations of said first and second runs of the flexible drive element; said first and second abutment surface means being spaced apart by a distance no greater than the diameter of the larger of said drive and driven



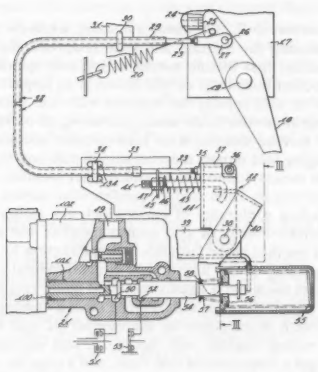
members and biasing means operatively connected to said support and said tensioning member and biasing said tensioning member toward the larger of said drive and driven members and against said flexible drive element.

3,931,746

CABLE ACTUATED CLUTCH CONTROL

Kenneth N. Hansen, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 17, 1973, Ser. No. 425,315
Int. Cl.[2] F16C 1/10
U.S. Cl. 74—501 R 10 Claims



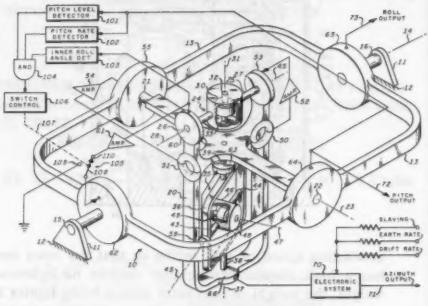
1. A cable actuated control mechanism on a vehicle including, a vehicle chassis, an operator control station including a platform and control console resiliently mounted on said chassis permitting relative movement between said operator station and said chassis, a control lever mounted on said control console, a servomechanism mounted on said vehicle chassis, a resilient overload linkage connected to said servomechanism, a flexible control mechanism to accommodate relative movement between said operator station and said chassis, including a sheathed cable comprising a sheath and means connecting one end of said sheath to said control console and means connecting the other end of said sheath to said chassis, a cable connected between said control lever and said resilient overload linkage to operate said servomechanism, said resilient overload linkage including resilient force transmitting means for limiting the peak load transmitted from said cable to said servomechanism when said control lever is actuated.

3,931,747

GYROSCOPIC STABLE REFERENCE DEVICE

James R. Erspamer, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 6, 1974, Ser. No. 440,119
Int. Cl.[2] G01C 19/02
U.S. Cl. 74—5.34 8 Claims



1. A three axis gyroscopic stable reference apparatus for navigable craft comprising:

first gimbal means pivotally mounted for rotation about a roll axis,

second gimbal means pivotally mounted on said first gimbal means for rotation about a pitch axis,

vertical gyroscope means for which said second gimbal means forms the outer gimbal means and further having inner gimbal means pivotally mounted on said second gimbal means for rotation about an inner roll axis,

directional gyroscope means pivotally mounted on said second gimbal means for providing an azimuthal reference,

control means including accelerometer means for providing signals representative of tilt in pitch and roll to maintain the spin axis of said vertical gyroscope means aligned with the gravity vertical,

inner gimbal pick off means responsive to said rotation of said inner gimbal means about said inner roll axis,

servo means responsive to said gimbal pick off means for rotating said first gimbal means to maintain said pitch axis perpendicular to said vertical gyroscope means spin axis,

pitch, roll, and azimuth pick off means coupled to said stable reference apparatus for providing attitude information about mutually perpendicular reference axes, and

circuit means for disabling said servo means jointly responsive to said pitch pick-off means and to said inner gimbal pick-off means for preventing unstable operation of said servo means.

3,931,748

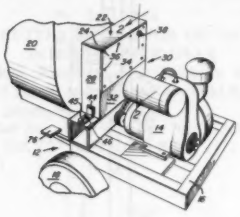
ADJUSTABLE GEAR ENCLOSURE FOR MIXER PINION AND BULL GEARS

Christian T. Tertinek, 3301 Cheshire Road, Canandaigua, N.Y. 14424, and Alan J. Stone, P.O. Box 354, Honeoye, N.Y. 14471

Filed June 24, 1974, Ser. No. 482,652
Int. Cl.[2] F16H 57/02
U.S. Cl. 74—606 R 2 Claims

1. In a portable mixing device including a wheeled support frame, a mixing chamber supported from said frame and having a horizontally disposed paddle shaft projecting therefrom with a bull gear connected thereto, a power device supported from said frame and having a drive shaft drivingly connected thereto, said drive shaft having a drive pinion gear thereon in meshing engagement with the bull gear for driving the paddle shaft from the power device, that improvement comprising an enclosure for said pinion gear and bull gear comprising a pair of vertical, spaced front and rear walls rigidly interconnected by vertical side walls and horizontal top

and bottom walls with the front wall disposed adjacent the power device, a bearing assembly mounted on each of said front and rear walls adjacent their juncture with the bottom wall and one of the side walls, said drive shaft extending through and being journaled by said bearing units with the pinion gear disposed between the front and rear walls, said bearing units being fixedly, non-adjustably and detachably mounted on the front and rear walls, a spacer on said drive shaft between the pinion gear and one of said bearing units to orient the pinion gear between the front and rear walls, said rear wall having a centrally disposed slot receiving said paddle



shaft, a seal unit encircling said paddle shaft, said seal unit including slot means therein for adjustable mounting of the seal means on the rear wall to enable the enclosure to be shifted laterally of the rotational axis of the paddle shaft, said enclosure including laterally extending slotted mounting brackets receiving fastening members for mounting the enclosure on the frame for lateral adjustment thereby enabling the rotational axis of the drive shaft, the pinion gear mounted thereon and the enclosure which journals the drive shaft to be laterally adjusted in relation to the stationary axis of the paddle shaft and bull gear thereon to provide alignment and backlash adjustment between the gears.

3,931,749

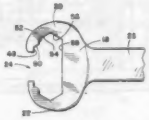
REVERSIBLE SELF-RETAINING RATCHETING WRENCH

James P. Evans, 3233 SW. 23 St., Oklahoma City, Okla. 73108

Division of Ser. No. 351,254, April 16, 1973, abandoned. This application Nov. 5, 1974, Ser. No. 521,088

Int. Cl. B25b *13/08*

U.S. Cl. 81—119 7 Claims



1. A ratcheting wrench for ratcheting four hexagonal members in which the distance between opposite sides is X_1, X_2, X_3 and X_4 and the length along a side is Z_1, Z_2, Z_3 and Z_4, respectively, the wrench comprising:

a body portion having a first jaw and a second jaw extending therefrom, the jaws being spaced apart from each other and providing a member receiving area therebetween, and a handle extending from said body;

the first jaw having an inner peripheral surface facing said member receiving area having six torqueing surfaces configured to engage a portion of the peripheral surface of the first and second hexagonal member, the first hexagonal member being larger than the second, the first surface being at the outer end of said first jaw and having a length less than one-half Z_1 the second surface intersecting the first surface at an angle of 120°, the third surface being contiguous to the second surface at the end thereof opposite the end intersected by the first surface, the length of the third surface being less than one-half Z_2, a fourth surface intersecting the third surface at an angle of 120°, a fifth surface intersecting the fourth surface at an angle of 120°, the length of the fourth and fifth surfaces each being at least equal to Z_2, and a sixth surface intersecting the fifth surface at an angle of 120°, the length of the sixth surface being greater than Z_1, the first surface being parallel to the sixth surface and spaced from it a distance at least equal to X_1 the third surface being parallel to the sixth surface and spaced from it a distance at least equal to X_2, the first, second and sixth surfaces snugly receiving and engaging three sides of the first hexagonal member, the third, fourth, fifth and sixth surfaces snugly receiving and engaging four sides of the second hexagonal member;

the second jaw having an inner peripheral surface facing said member receiving area having six torqueing surfaces configured to engage a portion of the peripheral surfaces of the third and fourth hexagonal member, the third hexagonal member being larger than the fourth, the first surface being at the outer end of said second surface intersecting the first surface at an angle of 120°, the third surface intersecting the second surface at an angle of 240° at the end thereof opposite the end intersected by the first surface, the length less than one-half Z_4, a fourth surface intersecting the third surface at an angle of 120°, a fifth surface intersecting the fourth surface at an angle of 120°, the length of the fourth and fifth surfaces each being at least equal to Z_4, and a sixth surface intersecting the fifth at an angle of 120°, the length of the sixth surface being greater than Z_3, the first surface being parallel to the sixth surface and spaced from it a distance at least equal to X_3, the third surface being parallel to the sixth surface and spaced from it a distance at least equal to X_4, the first, second and sixth surfaces snugly receiving and engaging three sides of the third hexagonal member, the third, fourth, fifth and sixth surfaces snugly receiving and engaging four sides of the fourth hexagonal member.

3,931,750

HELICAL SHEAR BLADE

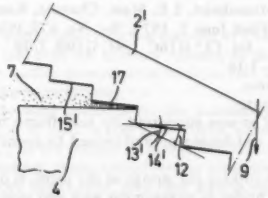
Hartmut Jabs, Verlautenheide, Germany, and Minny Wiemers, 05, Dusseldorf-Gerresheim, all of Germany, assignors to Severin Heusch; Ida Plankermann; Anneliese Gattersleben; Hermann Gattersleben, all of Aachen and Finny Thoennissen, Rott, Aachen

Filed Jan. 24, 1975, Ser. No. 543,869

Claims priority, application Germany, Feb. 1, 1974, 2404837

Int. Cl.² D06C *13/00*

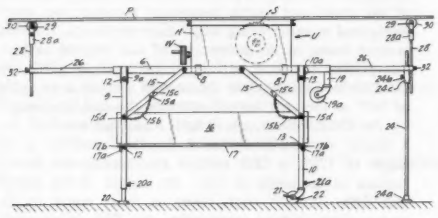
U.S. Cl. 83—672 5 Claims



1. Helical shear blade cutter cooperable with a straight-edge bed plate for trimming fibers projecting from an article, comprising a shaft, and a blade in the form of a helical band wound edgewise on and about said shaft, said helical blade having a free edge forming a cutting edge from which a cutting face of

said blade extends inwardly toward said shaft, said cutting face being formed with a serration to limit lateral yielding of the fibers as the fibers are being sheared by said cutting edge and the straight edge of the bed plate, said serration comprising saw-like teeth, respectively, having a short and a long flank, said long flank, in a condition wherein said shaft is disposed parallel to the straight-edge bed plate, forming a first angle with respect to the straight edge of the bed plate that is equal to the difference between a second angle formed by the cutting face of a blade without serrations formed therein and the straight edge of the bed plate and a third angle formed by said long flank and the cutting face of the blade without serrations formed therein.

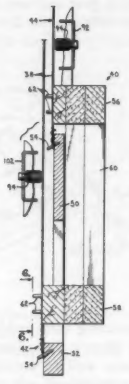
3,931,751
COLLAPSIBLE MOUNTING FOR POWER SAW UNITS
Paul A. Simonson, Roseglen, N. Dak. 58775
Filed Nov. 13, 1974, Ser. No. 523,444
Int. Cl.² B27B *5/22*
U.S. Cl. 83—859 **6 Claims**



1. A portable and collapsible mounting for conventional power saw units having in combination:
a rectangular rigid table top having front and rear ends and longitudinal sides,
means adjustably secured to said table top for supporting a power saw unit with its planar, material-supporting surface disposed above said table top,
a plurality of legs connected at their upper ends for rigid relation with said table top, said legs being collapsible for compactness and portability of said assembly,
bracing means between said table top and said legs and also between said legs for rigidifing said structure in use,
horizontal support means slidably mounted in said table top and extensible longitudinally of said top,
said support means near the outer end thereof carrying upstanding elements upon which are mounted support and guide means for slidably supporting work material at an elevation substantially aligned with the work-supporting surface of said saw unit.

3,931,752
PIANO WITH FLOATING BRIDGE
Charles E. Mussulman, 2 E. Main, Chanute, Kans. 66720
Filed June 7, 1974, Ser. No. 477,295
Int. Cl.² G10C *3/04;* **G10H** *3/08*
U.S. Cl. 84—1.16 **16 Claims**

1. In a piano:
frame means;
a bank of strings supported by said frame means under tension and having predetermined frequencies of vibration;
means for striking the strings as the piano is played;
a floating bridge in engagement with said strings and spanning the latter for placing the strings in a mechanical environment which causes the strings to react and deliver the proper piano wave form when each is struck, each string having an active length defined by said bridge and a supported end of the string;
means securing said bridge exclusively to said strings in said engagement therewith for support thereby, whereby the bridge is supported solely by the strings and transfer of vibrational energy from the bridge is precluded;
a plurality of pickup devices adjacent corresponding strings for sensing vibration thereof and converting detected vibration into electrical signals;



means mounting said devices at positions along the active lengths of the corresponding strings, said positions being selected to control the harmonic characteristics of said signals; and
electrical means coupled with said devices and responsive to said signals therefrom for producing an audible output characteristic of piano tones.

3,931,753
STRINGED MUSICAL INSTRUMENTS
Rudolph Dopera, 1410 Gaylord, Long Beach, Calif. 90813
Filed Aug. 5, 1974, Ser. No. 495,024
Int. Cl.² G10D *3/02*
U.S. Cl. 84—296 **27 Claims**

1. A stringed muscial instrument of the ampliphonic type which includes:
a body portion having a top board and a bottom board, said top board having a central opening;
a neck portion attached to and extending from said body portion;
a string holder mounted on said body portion;
a plurality of strings each adjustably secured at one end to said neck, extending therealong and across said body portion, and affixed at the other end to said string holder;
an imperforate resonant diaphragm having a central vibratory portion and an edge portion incorporating a flange which defines a downwardly facing peripheral channel;
mounting means secured to said body portion for mounting said diaphragm within said body, said mounting means including a resonant cylinder having an upper edge

adapted to engage said peripheral channel whereby said diaphragm is held firmly in place with said central portion being free to vibrate, the upper end of said cylinder being closed by said diaphragm and the lower end of said cylinder being open and spaced from said bottom board; and

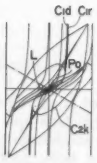
a bridge assembly mounted on said central portion of said diaphragm, said bridge assembly extending through said central opening in said top board and engaging said strings, whereby said strings rest on said bridge assembly to transfer sound vibrations to said diaphragm.

3,931,754

SKIVING CUTTER DEVICE FOR USE IN CUTTING INTERNAL SPUR GEAR

Komio Nishijima, Komatsu, and Masakazu Kojima, Kanazawa, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan

Filed Nov. 12, 1974, Ser. No. 523,136
Int. Cl.[2] B23F *1/06*; B26D *1/12*
U.S. Cl. 90—7 **2 Claims**



1. A skiving cutter device for use in cutting an internal spur gear comprising a spindle mounted on a cutter head, finish and rough skiving cutters having thereon cutter blades, each formed in a gear tooth, and mounted in vertical alignment on the spindle of said device and spacers adapted to compensate respective distances between said cutters and a reference plane on said spindle, wherein respective cutter blades of said cutters are located in the same phase and each cutter blade profile of said cutters is designed such that the contacting point between the respective cutter blades and each gear tooth formed on a workpiece to be cut is located within a contacting or acting region encompassed by respective interference lines at the root and bottom of the tooth formed on said workpiece to be cut and an interference line at the addendum of each cutter blade of said cutters, a key way located at least partially longitudinally of said spindle, wherein the cutters are adapted to operate upon said workpiece while mounted upon a receiving means and the longitudinal axis of said receiving means is offset from that of the spindle.

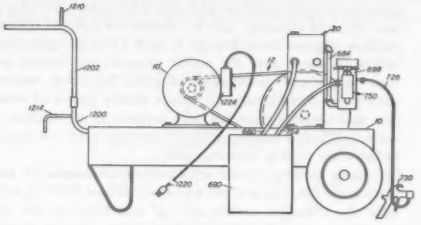
3,931,755

PUMP

Frank J. Hatridge, 5115 N. 16th St., Omaha, Nebr. 68110

Filed May 28, 1971, Ser. No. 148,155
Int. Cl. F01b *31/10*; F16j *15/18*
U.S. Cl. 92—155 **5 Claims**

1. A paint spraying assembly comprising: a paint spraying gun having an outlet orifice of a size for causing a paint flow to spread out into a spray, a pump having an inlet and an outlet, a conduit means interconnecting said gun and said pump outlet, a source of paint containing abrasive particles, conduit means connecting said source of paint with said pump inlet, a block having a pumping chamber therein having a chamber wall having a piston rod opening therethrough, an elongated piston rod means partly disposed in said chamber and extending through said piston rod opening and reciprocating along an axis, a teflon sealing assembly substantially sealing and filling the area between the walls of said piston rod opening and said piston rod means, that portion of said rod means which lies inwardly of said sealing assembly having a portion of maximum cross-sectional area as taken transversely of said piston rod means, said rod means portion having a sufficiently loose fit with respect to adjacent portions of said chamber wall as to substantially prolong the life of said portion of said rod means by reducing the abrasion of the rod means portion by abrasive particles disposed between said rod means portion and said chamber wall, said looseness of fit between said rod means portion and said chamber wall resulting in a by-passing of said rod means portion by paint, said fit being sufficiently close, however, as to provide substantial and effective pump pressure, said looseness of fit assuring a long working life before abrasion of said rod means portion causes need for its replacement, whereby said pump is free of any means therein allowing lubricating fluid to mix with paint therein in quantities such that said paint when it leaves said pump is substantially damaged in its drying characteristics.

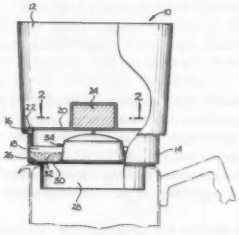


3,931,756

FILTER AREA LIMITING DEVICE FOR DRIP COFFEE MAKERS WITH MICROPORE FILTER

George H. Van Brunt, 1149 El Monte Drive, Thousand Oaks, Calif. 91360

Continuation-in-part of Ser. No. 286,098, Sept. 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 48,028, June 2, 1970, Pat. No. 3,695,168. This application Apr. 18, 1974, Ser. No. 461,943
Int. Cl.[2] A47J *31/10*, *31/06*
U.S. Cl. 99—306 **9 Claims**



1. A drip coffee maker for the brewing of a coffee infusion in quantity less than the nominal capacity of the drip coffee maker from coffee ground to at least as fine as drip grind coffee standards comprising:

a coffee-brewing chamber for the containment of coffee ground to at least as drip grind coffee standards;

an opening in the bottom of said coffee-brewing chamber, said opening being closed by an unsupported flexible micropore outlet filter, said filter having outlet openings of about 25 microns so as to substantially prevent passage of visible coffee sediment from said brewing chamber but to permit the passage of water-extracted coffee infusion therethrough;

water inlet flow control means in the top of said chamber, said flow control means having a plurlaity of inlet opening

of such size and quantity as both to direct and control the inflow of water into said brewing chamber so that the water flow to the grounds in said chamber is controlled to prevent turbulent lifting of all the grounds from said outlet filter, thus preventing fine sediment from settling on and plugging the micropore outlet openings as the coffee infusion passes through the filter so that the length of coffee-brewing time is consistent and uniform.

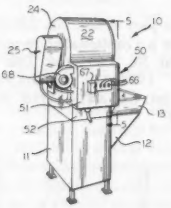
said flow control means being so positioned relative to the grounds in said chamber, and said inlet openings being of said size and quantity, also to control the upward venting outflow of gases therethrough in such a manner as to limit inflow of water until the coffee grounds are wetted and then to prevent entrapment of gases by freely venting such gases therethrough to ensure steady inflow of water into said brewing chamber with respect to the outflow of water-extracted coffee infusion through said micropore outlet filter during brewing; and

a filter area limiting device selectively positionable on said micropore filter to seal off a portion of said filter so as to limit the effective usable area of said filter so that the remaining area of said micropore filter exposed in said coffee-brewing chamber is appropriate for brewing a lesser amount of the coffee infusion than the nominal capacity of the drip coffee maker in the same total time of liquid flow.

3,931,757
ELECTRICALLY HEATED DRY CEREAL GRAIN EXPANDER

Raymond A. Goode, Elgin, Ill., assignor to Dunbar Manufacturing Co., Inc., South Elgin, Ill.

Filed Sept. 25, 1972, Ser. No. 292,264
Int. Cl.[2] A23L *1/18*
U.S. Cl. 99—323.11 **5 Claims**



1. An electrically heated corn popper or like grain expander for dry expansion of cereal grain, comprising:

a multi-perforate expansion chamber for receiving and retaining a supply of cereal grain for expansion, the expansion chamber having a main outlet for expanded grain and an auxiliary outlet for unexpanded grain and other waste;

agitation means for agitating the contents of the expansion chamber;

discharge means for initiating a discharge of unexpanded grain and other waste at a given location relative to the expansion chamber;

an electrically powered source of radiant heat energy, positioned adjacent to but spaced from the expansion chamber at a heater position displaced from the waste discharge location;

reflector means, at the heater position, for directing radiant heat energy from the heat source into the expansion chamber to heat the chamber and expand a supply of cereal grain contained therein;

a popper housing enclosing the expansion chamber, the popper housing having a radiant heat admission aperture aligned with the heater position;

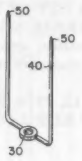
a heater housing, enclosing the radiant heat source and heater position;

and forced air cooling means for cooling the heat source without appreciable cooling of the expansion chamber.

3,931,758
SPIT

Donald Arthur Blake, Burnaby, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 28, 1974, Ser. No. 483,961
Int. Cl.[2] A47J *37/04*
U.S. Cl. 99—419 **1 Claim**



1. A spit, comprising:

a handle constructed from a plurality of elongated tubular telescopic sections;

a threaded bolt located at an end of the handle;

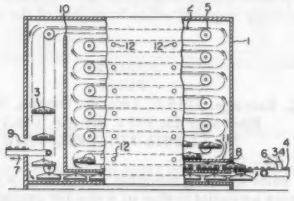
a head having a tapped hole and a plurality of elongated prongs upon which frankfurters and other foods may be impaled, the prongs being located at regular intervals along a straight line so as to be parallel to the axis of the handle when the bolt is threaded into the tapped hole and the head is thereby detachably secured to the handle; and

a rectangular wire mesh member having a turned in bent over peripheral lip around three adjacent sides, including two long sides, said member being detachably secured to the outer prongs by sliding the long sides of the member thereover, said outer prongs engaging the lip of said long sides, thus forming a flat perforated grill.

3,931,759
AUTOMATIC DEVICE FOR FINAL PROOFING

Torahiko Hayashi, 2-3 Nozawa-cho, Utsunomiya, Japan

Continuation-in-part of Ser. No. 137,397, April 26, 1971, abandoned. This application Feb. 13, 1974, Ser. No. 441,982
Claims priority, application Japan, Nov. 25, 1970, 45-103911
Int. Cl. A21c *13/02*
U.S. Cl. 99—468 **5 Claims**



1. A device for the automatic proofing of preformed dough materials placed on a conveyor in a housing, said conveyor being arranged to move upwards, comprising a plurality of vertically distributed adjustable openings in the wall of the housing for the supply of gas, and, associated with each of a plurality of the openings, a temperature detector, a first group of motor operated valves, and a temperature regulator, wherein the first motor operated valves are controlled by the said temperature regulators; and associated with each of a plurality of the openings, a humidity detector, a second group of motor valves, and a humidity regulator, wherein the second

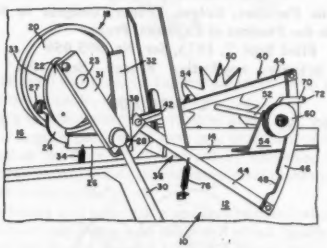
motor operated valves are controlled by the said humidity regulators, a separate means to supply heated gas and separate means to supply humid gas, first means to convey said heated gas to a plurality of said openings, second means to convey said humid gas to a plurality of said openings, wherein said motor-operated valves are in each of said first and second conveyance means, each said temperature regulator associated with each of the first conveyance means, each said humidity regulator associated with each of the second conveyance means, and means to compare the humidity and temperature detected by said detectors at each opening with the humidity and temperature selected by said regulators and to transmit signals to the motor-operated valves to adjust the said openings.

3,931,760

BALE LENGTH CONTROL MECHANISM

Leo George Cheatum, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 3, 1975, Ser. No. 554,637
Int. Cl.² B65B *13/18*
U.S. Cl. 100—4 **4 Claims**



1. In a baler having a tying mechanism actuated by a trip device that includes a rotary bale engaging element adapted to rotate a shaft in response to increasing bale length, a trip arm swingable between a lower stop position and an upper trip position wherein it actuates the tying mechanism, and including an arcuate track, having a stop mounted thereon to establish the stop position, and a wheel means operatively connected to the shaft and rotated thereby and engageable with the track to swing the trip arm upwardly to its trip position and disengagable therefrom to permit the trip arm to drop to its stop position, the improvement comprising: latching means operatively associated with the arm for releasable holding the arm in its stop position until the wheel engages the track to prevent the arm from bouncing away from its stop position when the arm initially drops to said position.

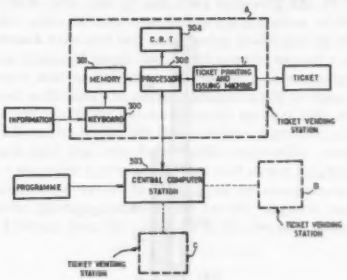
3,931,761

METHOD OF CONTINUOUS PRINTING OF DOCUMENTS

André Carrus; Pierre A. Carrus, and Jacques H. Carrus, all of 30 rue des Petits Hotels, 75010 Paris, France

Continuation-in-part of Ser. No. 186,676, Oct. 5, 1971, abandoned. This application Aug. 30, 1973, Ser. No. 392,933
Claims priority, application France, Oct. 9, 1970, 70.36558; Apr. 14, 1971, 71.13063; May 5, 1971, 71.16136
Int. Cl.² B41L *45/00*
U.S. Cl. 101—66 **5 Claims**

1. In an electronic system which handles input data representing the particulars of transactions such as wager transactions according to a corresponding transaction program and which is of the type comprising a plurality of ticket vending stations at different locations with each of the vending stations storing the input data, processing the input data in the form of coded characters, and printing and issuing a ticket under control of a computer provided at a central station which incorporates the program and receives the coded characters from the vending stations, the improvement wherein: processor means are provided at each vending station for writing said coded characters in a dot matrix having a predetermined number of writing elements arranged in mutually perpendicular scan and sweep lines; and wherein each vending station is further provided with a controllable means for feeding electrosensitive tape in a continuous manner past a printing head through each successive cycle of printing operation, the duration of each cycle of printing operation and the length of the electrosensitive tape so fed being dependent upon the number of coded characters to be printed and thus the complexity of



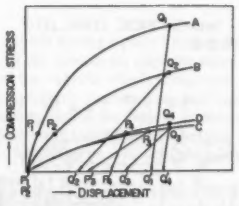
a transaction; an assembly of printing electrodes representing said sweep lines of said matrix and being disposed at the printing head across the direction of feed of said tape, said electrodes being operable through said matrix as the tape is fed past the printing head to print the successive matrix characters on the tape in the form of legible characters representative of the particular transaction; and means operable at the end of each printing cycle for severing that length portion of the tape which has been printed from the unprinted part thereof to thereby provide a printed ticket serving as a valid voucher for a properly registered transaction.

3,931,762

METHOD FOR PREPARING A PLASTIC RELIEF PRINTING PLATE

Nobuo Fukushima; Masakazu Inoue, both of Ibaragi; Ryouzo Takai, Takatsuki, and Kozo Hotta, Kokubunji, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and The Yomiuri Shimbun, Tokyo, both of, Japan

Filed Dec. 14, 1973, Ser. No. 424,765
Claims priority, application Japan, Dec. 18, 1972, 47-127452
Int. Cl.² B41D *3/04*
U.S. Cl. 101—401.1 **13 Claims**



1. In a method for producing synthetic resin relief plate by pressing a synthetic resin sheet onto a matrix, the improvement which comprises putting on the matrix a thermoplastic synthetic resin sheet which contains 0 – 80% by weight of inorganic filler and has a foaming ratio of 1 or $1 < a \leqq 4$ and in which the amount of the inorganic filler (% by weight) and the foaming ratio satisfy the formula $130 \geqq 20a + b \geqq 30$ wherein a represents a foaming ratio and b represents the

amount of the inorganic filler and then pressing the sheet in solid state and the matrix so that the thickness of the synthetic resin sheet before being pressed is larger than the thickness of the convex portions of the synthetic resin relief plate.

3,931,763

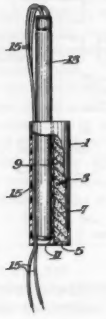
EXPLOSIVE PRIMING DEVICE

Harold Frederick Bluhm, Allentown, Pa., assignor to Atlas Powder Company, Wilmington, Del.

Filed Sept. 24, 1974, Ser. No. 508,872

Int. Cl.² F42B *3/10*

U.S. Cl. 102—28 R **9 Claims**



1. A primer unit for explosive materials comprising an elongated shell having a top and a bottom end, a compartment within said shell for housing explosive material, said compartment being walled off at the bottom end of the shell, a walled passageway which accommodates therein a No. 6 electric blasting cap and its lead wires when threaded through said passageway, said passageway extending completely through the shell structure endwise thereof, and an inwardly extending shoulder within the passageway which reduces the inner diameter of the passageway to a dimension which will allow said No. 6 cap by itself to pass through the reduced diameter opening but which prohibits the cap from passing through when the cap and its lead wires threaded completely through the passageway occupy the passageway.

3,931,764

ACCELERATOR SWITCH

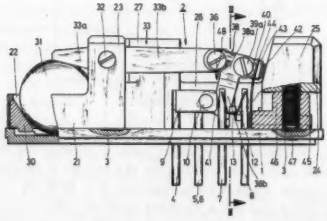
Roman Malisch, Neubiberg; Otmar Titus, Taufkirchen, and Dietmar Puttinger, Munich, all of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Germany

Filed June 21, 1974, Ser. No. 481,919

Claims priority, application Germany, June 28, 1973, 2332901

Int. Cl.² F42C *11/00, 1/10*

U.S. Cl. 102—70.2 R **12 Claims**



1. Acceleration switch, particularly for use in actuating an impact detonator having an ignition circuit, comprising a ball, a member forming a support surface for said ball, a switch actuating member positioned in contact with said ball so that said ball is held between the support surface of said member and said switch actuating member, wherein the improvement comprises a lever assembly displaceable between a first position preventing actuation of the impact detonator and a second position affording actuation of the impact detonator, said lever assembly comprises said switch actuating member and a second member pivotally connected to said switch actuating member at a position spaced from the position on said switch actuating member in contact with said ball, said second member forming a diaphragm at a position spaced from its point of pivotal connection to said switch actuating member, means forming a path of light rays arranged in the ignition circuit for effecting the closure of the ignition circuit, said diaphragm arranged to interrupt the path of the light rays when said lever assembly is in the first position and to be spaced from the path of the light rays when said lever assembly is in the second position so that the ignition circuit can be closed.

3,931,765

SOLID PROPELLANT DESIGNED TO BURN CENTRIPETALLY AND ITS USE IN ROCKET ENGINES OR OTHER MOTORS

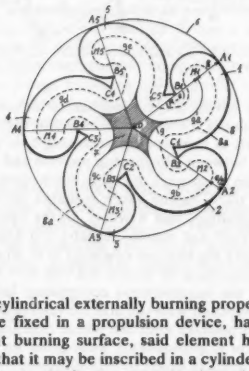
Pierre Louis Portalier, Sevres, France, assignor to Societe Nationale des Poudres et Explosifs, France

Filed Sept. 7, 1973, Ser. No. 395,059

Claims priority, application France, Sept. 26, 1972, 72.33943

Int. Cl.² F42B *1/00*

U.S. Cl. 102—99 **7 Claims**



1. A solid cylindrical externally burning propellant element adapted to be fixed in a propulsion device, having substantially constant burning surface, said element having a cross section such that it may be inscribed in a cylinder of radius R, and longitudinal axis O, the cross section of said element exhibiting rotational symmetry of order *n* about said longitudinal axis of the element, wherein *n* is an integer number greater than or equal to 2, the cross section of the element having a contour consisting of identical and convoluted lobes, wherein *n* is as defined hereinabove, each of said lobes being connected to its adjacent lobes, the portions of the lobes which are the farthest from the axis O of said cylinder of radius R being curved and consisting of semicircular arcs of radius *e*, wherein *e* is the combustion thickness of the element, each of said semicircular arcs being tangential to said cylinder of radius R at a point which coincides with one end of the said semi-circular arcs, each of said semicircular arcs being extended by a convex arc of a circle of radius at least equal to 2*e*, each of said convex arcs being tangential to said cylinder of radius R, at the same point at which each of said semicircular arcs is tangential to said cylinder of radius R, said propellant element giving a single residue of polygonal shape, on combustion, said element being anchored in said propulsion device through attachment means set in the location of said residue, the external contour of said residue being situated at

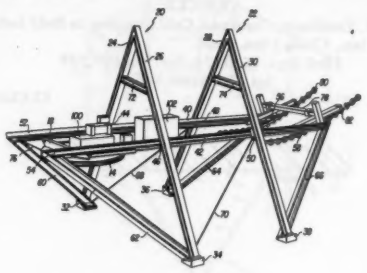
a distance *e* from the external contour of each lobe, *e* being as defined hereinabove.

3,931,766

CHAIRLIFT TERMINAL

Gaston Cathiard, Uriage, France, assignor to Pomagalski S.A., Fontaine, France

Filed Dec. 19, 1974, Ser. No. 534,470
Claims priority, application France, Dec. 20, 1973, 73.46437
Int. Cl.² B61B *11/00*
U.S. Cl. 104—117 7 Claims



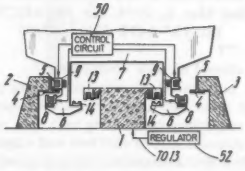
1. Terminal of an aerial cable transporter with a continuously moving cable, comprising:
a cable return sheave with vertical axle,
two triangular piers, each with legs in steel sections assembled in the form of an inverted V, with fixed bases, the piers standing in two spaced transversal planes perpendicular to the cable,
two bracing and supporting girders symmetrically arranged on each side of the said cable and which rigidly interconnect the legs of the said piers and extend beyond at least one of the said piers to form a pair of projections,
one train of compression sheaves carried by each of the said projections,
and a means of suspension of the said return sheave from the said girders.

3,931,767

MAGNETIC SUSPENSION RAILWAY

Ludwig Karch, deceased, late of Munich, Germany, by Hermine Karch, administratrix, assignor to Messerschmitt-Bolkow-Blohm GmbH, Germany

Filed Feb. 28, 1974, Ser. No. 446,759
Claims priority, application Germany, Mar. 3, 1973, 2310718
Int. Cl.² E01B *25/06*
U.S. Cl. 104—130 13 Claims



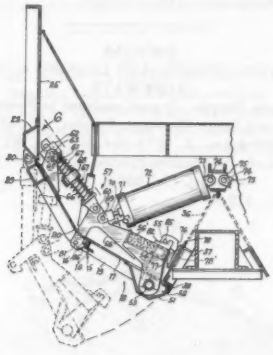
1. A magnetic suspension railway, comprising a car having a horizontal longitudinal axis, a plurality of electrically controlled car carrier magnets, a plurality of electrically-controlled car guide magnets, a plurality of fixed magnetizable track rails, holding means mounted under the car and spaced interiorly of the track rails relative to the axis for holding said car carrier magnets in a suspended position vertically relative to the rails and holding the guide magnets in positions laterally between the rails, said rails branching into two paths at a branch section, said car guide magnets being distributed on opposite sides of the axis, circuit means in the car coupled to said magnets for energizing the magnets to suspend the car and guide the car over the rails and for deenergizing the guide magnets on one side of the car relative to the guide magnets on the other side of the car within the switch section so as to guide the car in the switch section onto one path and away from the other, two switch rails mounted on said holding means at a portion away from the track rails and in the direction of the axis and on opposite sides of the axis, two rows of electrically controlled switch magnets stationarily mounted in the switch area, one of said rows following one of the paths and the other of said rows following the other of the paths, said switch rails and said rows being positioned so that when the car passes through the switch section one of said switch rails and said switch magnets in one row are magnetically coupled sufficiently to support magnetically at least one side of the car while the carrier-magnets on that side are disengaged from the track rails in the switch area, said one switch rail and said one row being sufficiently offset horizontally from a magnetic symmetry so that said switch magnets impart a lateral force upon the switch rail to compensate for the magnetic disengagement of the carrier magnets on the one side of the car from the track rail on the one side of the car.

3,931,768

HOPPER VEHICLE

Albert E. Price, Brookfield, and Erling Mowatt-Larssen, Warren, both of Ohio, assignors to General American Transportation Corporation, Chicago, Ill.

Filed Dec. 4, 1974, Ser. No. 529,499
Int. Cl.² B61D *3/00*
U.S. Cl. 105—240 18 Claims



1. A hopper vehicle having a pair of bottom hoppers extending lengthwise of the vehicle on opposite sides of the vertical central plane of the vehicle, which comprises:
a supporting structure including support means extending from about one end of the vehicle to about the other end of the vehicle and located at the bottom portion of the vehicle for mounting on wheeled assemblies of the vehicle;
a body structure including: end walls; side walls;
an inverted generally V-shaped panel mounted on said support means and extending lengthwise of the vehicle and providing a part of said hoppers; and
a door assembly hingedly mounted at its upper margin on each of said side walls to swing outwardly and constructed to provide one side of one of said two hoppers of the vehicle;
a door-operating mechanism for each of said door assemblies and located intermediate the length of the door

assembly, each of said door-operating mechanisms including:

a lever pivotally mounted at its bottom end on the bottom margin of said door assembly and movable between a first position abutting the inside of said door assembly when the door is unlocked and a second position spaced from the inside of said door assembly when the door is closed and locked;

latching means mounted on said door assembly and including a latching lug, said latching means and said lever being constructed and arranged to provide movement of said latching lug of said latching means when said lever is pivotally moved from said second position to said first position; and

power means mounted on said support means and operatively connected to said lever to provide a force in one direction for movement of said lever from said second position to said first position and to provide a force in the opposite direction on said lever for return movement of said door assembly to its closed position and movement of said lever from said first position to said second position;

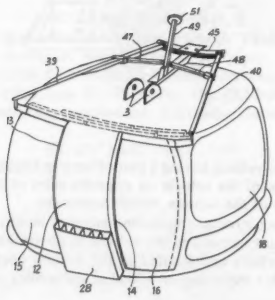
locking means, including a locking lug, mounted on said supporting structure in alignment with each of said latching lugs of said latching means to have said locking lugs engaged in a locking manner by said latching lugs after said door assemblies are closed and said levers have been moved to their second positions; and

one of said latching means and of said locking means, for each side of said hopper vehicle, has a construction, including spring means that engages said lug of that one means having said spring means, so that this engaged lug is movable in the event that said latching means abuts said locking means during a closing of said door assembly and is returned by said spring means to its normal position when the door assembly is closed.

3,931,769
AUTOMATIC OPENING AND CLOSING CABIN FOR ROPEWAYS

Francis Tauzin, Veyrins, France, assignor to Pomagalski S.A., Grenoble and Sigma Plastique, Veyrins, both of, France

Filed Aug. 2, 1974, Ser. No. 494,181
Claims priority, application France, Aug. 7, 1973, 73.28795
Int. Cl.² B60N *1/04*
U.S. Cl. 105—329 S **7 Claims**

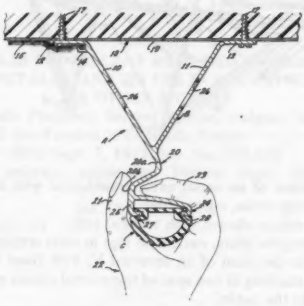


1. Cabin with automatic door opening and closing mechanism, for ropeways, comprising a carrier frame structure, a cabin housing supported by said carrier frame structure, said cabin housing comprising a pair of shells of plastic material and assembled together along a transverse vertical median joint plane, two lateral apertures provided on a same side of cabin housing, on either side of said joint plane and spaced the one from the other by a solid wall portion, a sliding door associated with each one of said two apertures, said sliding doors being adapted to pass from a closed position to an open position by moving towards each other against an inner face of said solid wall portion, and a pair of bench-forming seats disposed transversely and back to back, very close to each other, in a transverse space extending normally to said solid wall portion whereby transverse spaces extending normally to said apertures remain substantially unobstructed.

3,931,770
PASSENGER HAND ASSIST RAIL FOR TRANSIT VEHICLE

Keith W. Tantlinger, Coronado, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Sept. 26, 1974, Ser. No. 509,329
Int. Cl.² B60N *5/00*
U.S. Cl. 105—354 **12 Claims**



1. An elongate hand assist rail secured to, and extending lengthwise along an upper portion of a transportation vehicle having a floor, side walls and ceiling, said rail being of substantially uniform cross sectional size and shape throughout its length, and comprising:

a pair of diverging web portions intersecting and joined along their converging edges;

means for mounting the free edges of the diverging web portions to such upper portion of the vehicle;

a third web portion extending from the intersection of the diverging web portions; and

a hand grip portion of bulbous cross sectional shape substantially integral with, and extending along, the free edge of the third web portion.

3,931,771
EXTENDABLE EDUCATIONAL MODULE

Edward J. Kramer, Rte. 1, Box 846, Clinton, Wash. 98236

Filed Mar. 6, 1974, Ser. No. 448,706
Int. Cl.² A47B *17/03, 37/00*
U.S. Cl. 108—77 **12 Claims**

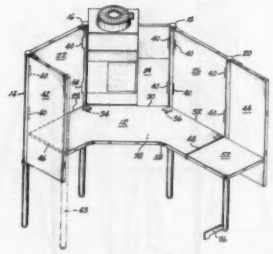
1. An educational module comprising:

a generally horizontally positioned writing panel having a near edge presented adjacent a seated user, a rear edge, and two end edges connecting said near and rear edges, wherein intersections of said two end edges and said rear edge define first and second writing panel corners;

supporting means for said module, including at least two upright support members which extend from a support surface to a point above said writing panel, said two support members being positioned adjacent said first and second writing panel corners;

vertical panel means partially enclosing said writing panel, said vertical panel means being supported adjacent said end edges and said rear edge of said writing panel, said vertical panel means extending from a point below said writing panel to a point above said writing panel at least

to head level of the seated user, said vertical panel means including two end panels supported adjacent said end edges, at least one of said two end panels being movable between two spaced operative positions without disturbing the structural integrity of the module, one of said two spaced positions being adjacent one end edge of said writing panel, the other of said two spaced positions being



relatively away from said one end edge of said writing panel; and

means securing said vertical panel means to said supporting means, inlcuding first means movably securing said one end panel to one of said two support members, permitting movement of said one end panel between said two spaced positions.

3,931,772

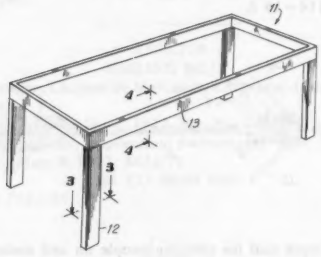
ARTICLE OF FURNITURE AND METHOD OF MANUFACTURE

Paul Puccio, and John Puccio, both of 54 Nassau Blvd., Garden City, N.Y. 11530

Filed Mar. 28, 1973, Ser. No. 345,809

Int. Cl.² A47B *13/00*

U.S. Cl. 108—161 **6 Claims**



1. A stone covered article of furniture comprising in combination substantially elongated stone members, each of said substantially elongated stone members defining a part of said article of furniture, each said substantially elongated part having a cavity therein, each said cavity having a substantially elongated reinforcing member therein which is spaced from the interior wall thereof; and epoxy means within the space between each said reinforcing member and the associated interior wall of each said stone member defining each said cavity, said reinforcing member being completely surrounded by said epoxy means.

3,931,773

ASH REMOVAL APPARATUS FOR COAL-DUST FIRING EQUIPMENT

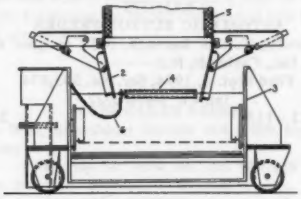
Eberhard Reimann, Bunde, Germany, assignor to EVT Energie-und Verfahrenstechik GmbH, Stuttgart, Germany

Filed Dec. 13, 1974, Ser. No. 532,738

Claims priority, application Germany, Dec. 22, 1973, 2364366

Int. Cl.² F23J *1/00*

U.S. Cl. 110—165 R **6 Claims**



1. An improved ash removal apparatus for coal-dust firing equipment including a firebox having an ash outlet, comprising:

a scraper-chain conveyor including a water trough disposed below an said ash outlet of said firebox;

a hood, coupled to and communicative with said firebox outlet, disposed over and extending into said conveyor trough; and

a plurality of spaced apart floatable members, disposed within said hood and rotatable about their own longitudinal axes, for floating on the surface of the water contained in said trough within said hood and catching ashes falling from said firebox outlet on the surfaces thereof.

3,931,774

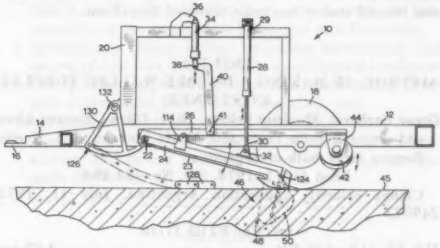
SEEDLING PLANTER APPARATUS

Edmund G. Bradley, Gormley, Canada, assignor to Her Majesty the Queen in right of Ontario, as represented by the Minister of Natural Resources, Toronto, Canada

Filed June 21, 1974, Ser. No. 481,668

Int. Cl.² A01C *11/00*

U.S. Cl. 111—3 **10 Claims**



1. Planting apparatus, comprising:

a mobile frame adapted to travel forwardly over the ground,

an arm swingably mounted to the frame and extending generally rearwardly from the mounting location,

dibble means carried by the arm remote from said mounting location and adapted to cut into the ground when the arm swings toward the ground during forward travel of the frame,

planter means carried by the arm rearwardly of said dibble means and adapted to support a seedling for planting in the cut made by said dibble means,

dislodging means adapted selectively to dislodge a seedling from said planter means into said cut,

detection means for detecting when the dibble means has cut to a pre-determined depth into the ground and for activating said dislodging means whenever such pre-determined depth is reached,

and means for regularly swinging the arm toward and away from the ground,

whereby said dislodging means fails to operate if the dibble means fails to achieve said pre-determined depth due to an obstacle.

3,931,775

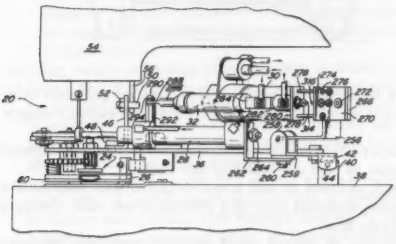
AUTOMATIC BUTTON FEEDER

Wenzel Zaruba, Totowa Borough, N.J., assignor to Textol Systems, Inc., Carlstadt, N.J.

Filed Sept. 6, 1974, Ser. No. 503,574

Int. Cl.² D05B *3/22*

U.S. Cl. 112—113 **26 Claims**



1. An automatic button feeder comprising a first station for receiving buttons in sequence and including orientation means, a second station at which a button is sewn and an injection member for moving the button from said orientation station to the sewing station, said injection member including alignment pins which are used in combination with orientation means which align the openings of the buttons with the alignment pins, said feeder also including means for moving the injection member which draws the pins of the member under said first station, the openings of said button are aligned with the pins by said orientation means, said member remains stationary after the button has been aligned until a button at said second station has been removed therefrom.

3,931,776

METHOD OF MAKING A DOUBLE-WALLED TUBULAR CONTAINER

Oscar Barberis, Mariano Pelliza, 2831, Olivos, Buenos Aires, and Angel Rogelio Testi, Jose Maria Moreno, 321, Haedo, Buenos Aires, both of Argentina

Filed July 1, 1974, Ser. No. 484,884

Claims priority, application Argentina, July 11, 1973, 249023

Int. Cl.² B21D *51/36*

U.S. Cl. 113—120 XY **3 Claims**

1. A method of making a double-walled tubular container, comprising:

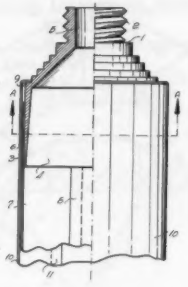
a. providing a container top having an outlet passage and a skirt portion extending longitudinally of the container top, a plastic sheet having a pair of opposed longitudinal edges, and a metallic sheet having a pair of opposed longitudinal edges;

b. winding said plastic sheet on a cylindrical mandrel to form a tubular plastic sleeve with said pair of opposed longitudinal edges of said plastic sleeve overlapping to define a longitudinally extending seam of the tubular plastic sleeve;

c. inserting said container top skirt within said tubular plastic sleeve;

d. heating said tubular plastic sleeve to simultaneously seal said tubular plastic sleeve to said container top skirt and seal the longitudinally extending seam of said tubular plastic sleeve;

e. winding said metallic sheet on said tubular plastic sleeve to form a tubular metallic sheath overlying said tubular plastic sleeve with said pair of opposed longitudinal edges



of said metallic sheet overlapping to define a longitudinally extending seam of the tubular metallic sheath, said metallic sheath overlying a portion of said tubular plastic sleeve sealed to said container top skirt; and

f. heating said tubular metallic sheath to simultaneously seal said tubular metallic sheath to said tubular plastic sleeve and seal the longitudinally extending seam of said tubular metallic sheath.

3,931,777

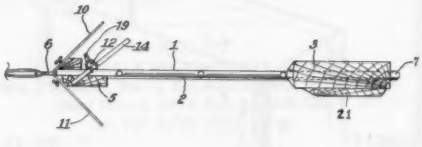
AQUA SLED

William B. Colgan, Shalimar, Fla., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 12, 1975, Ser. No. 557,508

Int. Cl.² A63C *15/00*

U.S. Cl. 114—16 A **3 Claims**



1. An aqua sled for carrying people on and under water, comprising

a frame of aluminum tubing having a substantially rigid substantially planar section of transparent material to enable users to see beneath the sled and buoyant material affixed thereto to float the sled, the frame having a front, a back and sides;

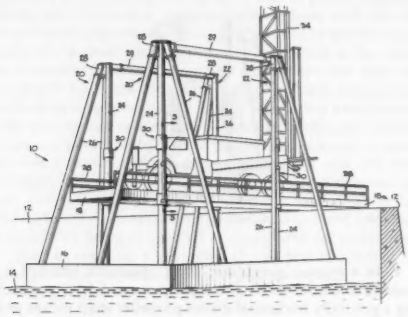
a pair of sheets of substantially rigid transparent material affixed to the front of the frame and forming a dihedral of approximately 90° with each other, each extending at an angle of approximately 45° with a corresponding side of the planar section of transparent material; and

control means affixed to the frame and manually controllable to control the movement of the sled.

3,931,778
SUPPORT BARGE METHOD AND APPARATUS

Edward E. Miller, and Eberhard V. Ranft, both of Houston, Tex., assignors to Raymond International, Inc., Houston, Tex.

Filed Aug. 8, 1974, Ser. No. 495,909
Int. Cl.² B63B 35/28; E02B 7/08
U.S. Cl. 114—26 4 Claims



1. A device for use in the repair of dam walls, said device comprising a barge, means for mooring said barge with one edge lying adjacent a dam wall, a platform carried by said barge, said platform having a portion thereof extending but from said barge past said one edge, forward and rearward platform lifting means positioned on said barge near to and back from said edge respectively, said platform lifting means being arranged to lift said platform off from the upper surface of said barge and above the dam wall prior to mooring and to lower the platform down onto said dam wall after mooring, means for engaging and disengaging said forward platform lifting means with the platform after the platform is so lowered and means pivotally interconnecting said platform to said rear lifting means to permit pivoting of said platform with respect to said barge, whereby after said platform is lowered onto the dam wall, the detachable engaging and disengaging means is disengaged so that the weight of the platform is carried by the dam wall and the rearward lifting means and wherein minor fluctuations in water level are compensated for by the pivotal connection.

3,931,779
SAILING BOAT

Sten Kreuger, Chateau de Malvande, Chambesy-Geneva, Switzerland

Filed May 1, 1972, Ser. No. 249,154
Claims priority, application Switzerland, Apr. 30, 1971, 6382/71; Mar. 8, 1972, 3434/72
Int. Cl.² B63H 9/00
U.S. Cl. 114—39 8 Claims

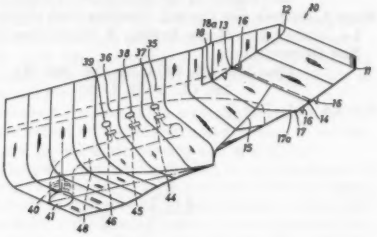
1. A boat comprising:

a. a hull having a direction of elongation and a waterline,
b. a mast mounted on said hull,
c. a boom pivotally mounted on said mast,
d. a mainsail supported by said mast and said boom, said boom attached to and extending the foot of the mainsail,
e. a blade mounted on the free end of said boom and pivotal about an axis perpendicular to the direction of elongation of said hull,
f. said blade protruding downward below the waterline of said hull so as to act as a rudder for steering said boom when said boat is moving through a body of water, and
g. means for setting the angular position of said blade about said pivotal axis.

3,931,780
ICEBREAKER VESSEL

Heinrich Was, Bramfelder Strasse 164, 2000 Hamburg 33, Germany

Filed July 18, 1974, Ser. No. 489,488
Claims priority, application Germany, Aug. 30, 1973, 2343719; June 14, 1974, 2428801
Int. Cl.² B63B 35/08
U.S. Cl. 114—41 6 Claims



1. An ice breaker vessel including a ship's hull having a forecastle comprising:

a bow of said vessel extending in a generally linear configuration across said forecastle from port to starboard substantially at the upper most portion of said forecastle;
a substantially planar section extending downwardly and astern of said bow in a generally quadrilateral configuration contiguously with said bow and substantially across said entire vessel from port to starboard; and
a keel portion having an acuminated configuration directed forwardly of said vessel located astern of said planar section and having a configuration extending contiguously therewith.

3,931,781
STABILIZER UNIT FOR MARINE VESSELS

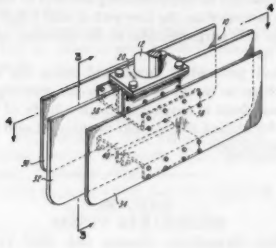
Everett P. Larsh, 1001 E. Ridge Lane, Miami, Fla. 33157

Filed Nov. 18, 1974, Ser. No. 524,634
Int. Cl.² B63B 39/06
U.S. Cl. 114—126 7 Claims

3. An anti-roll stabilizer for a marine vessel having a rotatable shaft with an outer end portion projecting outwardly from the hull of the vessel, comprising:

a plurality of fin elements disposed in substantially parallel spaced relation with each set of adjacent fin elements defining a fluid channel therebetween,
means for rigidly connecting said fin elements to maintain said parallel spaced relation and to form a rigid multiple-fin stabilizing unit, and
means for rigidly securing generally the center portion of

said multiple-fin stabilizing unit to said outer end portion of said shaft with said fins extending substantially parallel



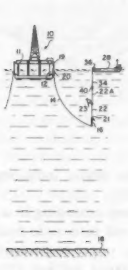
to said shaft and to effect rotation of said unit on the axis of said shaft.

3,931,782

MOORING METHOD FOR DEPLOYMENT AND RETRIEVING OF MOORING LINES

Mark A. childers, and Enoch L. Dawkins, both of New Orleans, La., assignors to Ocean Drilling & Exploration Company, New Orleans, La.

Filed Sept. 26, 1974, Ser. No. 509,581
Int. Cl.² B63B 21/50
U.S. Cl. 114—206 R **7 Claims**



1. The method of employing a service ship having anchor-deploying equipment for assisting in the mooring to the seabottom of a structure floating in a body of water,

said structure having mooring means including a mooring line attached to an anchor,

said ship being on the surface of said body of water and having a service line,

a hook attached to the service line,

said method being characterized by utilizing the following steps:

moving the service ship near said structure,

coupling the hook to said mooring means;

progressively releasing the mooring means from the structure into the body of water;

supporting the mooring means with the service line;

moving the ship away from said structure to a desired location;

progressively lowering the service line through the body of water;

burying the anchor in the seabottom;

detaching the hook from the mooring means;

taking in the service line onto the ship; and

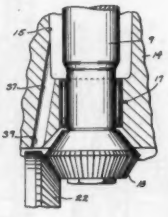
mooring said structure to said mooring means.

3,931,783

OIL CIRCULATING SYSTEM FOR MARINE PROPULSION GEAR CASE

Elmer E. Croisant, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Oct. 3, 1973, Ser. No. 403,317
Int. Cl.² B63H 5/12
U.S. Cl. 115—34 R **9 Claims**



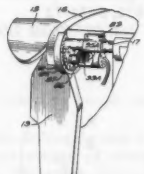
1. In a marine propulsion drive apparatus adapted to be secured to a boat with a pendant submerged drive unit including a generally horizontal driven propeller shaft means and an offset generally vertical drive shaft means coupled by relatively fixed drive positioned rotating bevel gear meshes within said unit, said bevel gear means including a pair of meshing bevel gears defining a pocket at the engaging surfaces of the gears, said unit being essentially liquid tight and containing a liquid lubricant, said bevel gear means being in essentially open communication with said liquid lubricant in said unit, an improved lubricant circulating means comprising a circulation passageway means having an inlet means located immediately adjacent the bevel gear means to pick-up forced lubricant from the periphery of the rotating gear means, said inlet means being limited to alignment with said pocket and adjacent to the periphery and offset from the position of maximum bevel gear engagement and located in close spaced relation to the engaging side of the bevel gear means, and a return flow path located in a low pressure area for return flow of the forced lubricant within said unit.

3,931,784

TILT POSITION INDICATOR

Raymond D. Collis, Round Lake, and Martin H. Meyer, Libertyville, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 321,049, Jan. 4, 1973, Pat. No. 3,844,247.
This application Aug. 26, 1974, Ser. No. 500,328
Int. Cl.² B63H 5/12
U.S. Cl. 115—41 R **2 Claims**



1. A marine propulsion device comprising means for attachment to the hull of a boat, a propulsion unit pivotally connected to said attachment means about a tilt axis for vertical swinging movement of said propulsion unit relative to said attachment means, and means for indicating the position of said propulsion unit relative to said attachment means com-

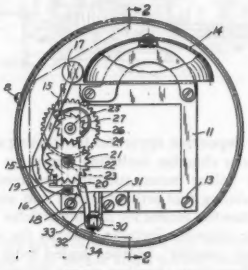
prising a gauge including an indicator movable in response to variation in electrical current, and means physically connected between said propulsion unit and said attachment means and electrically connected to said gauge for varying the electrical current supplied to said gauge in response to vertical swinging movement of said propulsion unit, said means for varying said electrical current comprising a circular rack physically connected to one of said propulsion unit and said attachment means and including a plurality of teeth extending in an arcuate series at a uniform distance from said tilt axis with said teeth individually extending parallel to said tilt axis, a rotatably mounted pinion physically connected to the other of said attachment means and said propulsion unit and enmeshed with said rack for rotation of said pinion in response to vertical swinging movement of said propulsion unit relative to said attachment means, and a variable resistance electrically connected in series to said gauge and including a resistance coil mounted on one of said propulsion unit and said attachment means and a wiper movably electrically connected to said coil for varying the current flow to said gauge in response to relative movement between said wiper and said coil, said wiper also being connected to said pinion for rotation of said wiper in response to rotation of said pinion incident to vertical swinging movement of said propulsion unit.

3,931,785

AUTOMATIC FIRE ALARM

James R. Keeley, 10627 25th S.W., Seattle, Wash. 98146, and Russell Everson, 2041 S. 320th No. 160, Federalway, Wash. 98002

Filed Nov. 18, 1974, Ser. No. 524,662
Int. Cl.² G08B 17/00
U.S. Cl. 116—106 **4 Claims**



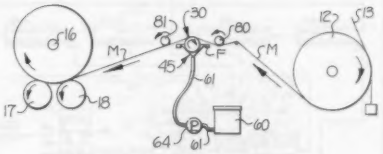
1. In fire alarm means, a frame; a sound producing device; a pivotally mounted arm capable, when oscillated, of sounding said sound producing device; spring actuated arm oscillating means connected with said arm; a cup shaped member rigidly supported from said frame; another cup shaped member rigidly supported by said arm, said two cup shaped members being formed of material having good heat conducting characteristics and being positioned close together with their concave sides in opposed relation; and a body of heat responsive material which is firm at normal room temperatures and has a melting temperature substantially in excess of normal room temperature, interposed between and filling said cup shaped members, said body holding said cup shaped members apart at normal room temperatures and softening and bringing about oscillation of said arm and sounding of said sound producing devices when subjected to a temperature substantially in excess of normal room temperature.

3,931,786

APPARATUS FOR COATING A WEB OF MATERIAL WITH A LIQUID

Richard K. Teed, Greenwood, S.C., assignor to Riegel Textile Corporation, New York, N.Y.

Filed Feb. 13, 1974, Ser. No. 442,086
Int. Cl.² B05C 11/00
U.S. Cl. 118—6 **11 Claims**



1. Apparatus for continuously applying and evenly coating a moving web of material with a predetermined amount of a liquid and characterized by simplicity of design, uniformity of application of the liquid and accurate control of the amount of liquid applied; said apparatus comprising:

driven means for feeding the web of material in a longitudinal path of travel at a predetermined constant speed;

elongate, open top, pan means for continuously receiving the coating liquid therein and extending transversely of the traveling web;

driven means for continuously metering coating liquid to said pan means in the predetermined amount to be continuously applied to the moving web of material;

driven, elongate, rotating coating roll means positioned in the path of travel of the web of material and extending generally transversely of the web for rotating contact with one surface of the moving web at a predetermined constant speed and including a covering of soft, uniformly and highly absorbent material disposed around the circumference thereof and having a capacity for receiving and continuously uniformly absorbing the predetermined amount of coating liquid being continuously metered and for transferring and uniformly coating the traveling web with the liquid, said coating roll means being positioned partially within said pan so that a portion thereof not in contact with the web rotates within said pan through the open top thereof for contacting and continuously absorbing an amount of the coating liquid within said pan above the level of said roll means corresponding to the amount being metered into said pan by said metering means; and

means operatively connected with said web feeding means, said metering means and said coating roll means for continuously driving same in predetermined relation to each other for applying and evenly coating the moving web of material with a predetermined amount of the liquid.

3,931,787

APPARATUS FOR APPLYING SOLID PARTICLE MATERIAL TO A STRIP

Ralph Kuttner, Fullerton, and Wallace T. Morrison, Whittier, both of Calif., assignors to Stoody Company, Santa Fe Springs, Calif.

Filed June 20, 1973, Ser. No. 371,801
Int. Cl.² B05C 11/10, 19/00
U.S. Cl. 118—8 **8 Claims**

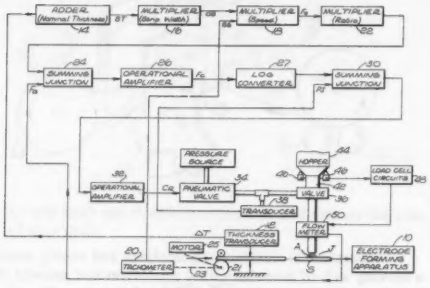
1. A system for joining solid particle material with solid strip material at a junction, in accordance with a predetermined weight ratio, comprising:

means for moving said strip material to flow relative to said junction;

means for indicating the flow rate of said strip material relative to said junction in terms of weight per unit of time;

means for flowing said solid particle material onto said strip material at said junction;

means for sensing the flow rate of said particle material in terms of weight per unit of time and including an impeller for forcefully propelling said material and means for



sensing the reactive force on said impeller as an indication of said flow rate of said particle material;

means for comparing the flow rates of said strip material and said particle material with said predetermined weight ratio to provide a control signal; and

means for controlling the relationship between said means for moving and said means for flowing in accordance with said control signal.

3,931,788

ADHESIVE EXTRUDING NOZZLE-GUIDANCE ARRANGEMENTS

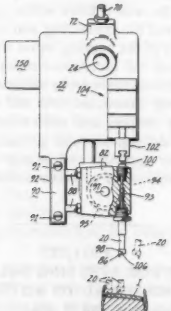
Ronald O. C. Gadd, Leicester; Robert C. Quarmby, Groby, and Frank R. Smith, Leicester, all of England, assignors to USM Corporation, Boston, Mass.

Filed Jan. 13, 1975, Ser. No. 540,411

Claims priority, application United Kingdom, Jan. 31, 1974, 4455/74

Int. Cl.² B05C *3/02*

U.S. Cl. 118—8 **7 Claims**



1. A machine for manufacturing shoes, said machine having a shoe support, and lasting elements which are relatively movable generally lengthwise with respect to a shoe on said support, for securing a shoe upper to a shoe bottom, including:

means for applying adhesive progressively to the margin of said shoe bottom, said means comprising at least one nozzle through which adhesive is extruded;

means for moving said nozzle from an inoperative position outwardly widthwise of the shoe to a location limited by an adjustable stop means, said nozzle having a shoe bottom engaging portion and a heightwise extending guide portion adapted to engage the peripheral edge of the shoe bottom;

means for biasing said nozzle inwardly toward the middle of said shoe bottom to maintain engagement between said guide portion of said nozzle and the edge of said shoe bottom during the relative movement therebetween, said stop means being ineffective during said relative movement to permit said guide portion to follow the peripheral contour of the shoe bottom.

3,931,789

VAPOR DEPOSITION APPARATUS

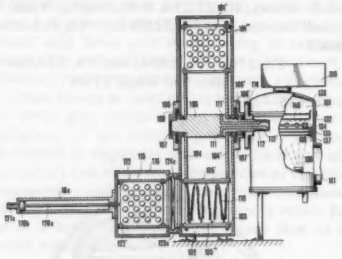
Mitsuo Kakei, Tokyo; Keijiro Nishida, Kanagawa; Tadayoshi Kasahara, Hino; Masao Shimabayashi, Kawasaki; Ryozo Hiraga; Tomomasa Nakano, both of Yokohama, and Ichiro Komatsubara, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Apr. 19, 1974, Ser. No. 462,504

Claims priority, application Japan, Apr. 28, 1973, 48-48674

Int. Cl.² C23C *13/08*

U.S. Cl. 118—49 **8 Claims**



1. A vacuum deposition apparatus for treating articles comprising an annular chamber including means for heating said articles, article holder means rotatably mounted within the chamber for orbiting said articles within said annular chamber, sealable chamber means for passing articles into and out of said annular chamber including means for continuously maintaining said annular chamber sealed from its external environment, deposition chamber means for treating articles disposed therein, means defining sealable path means through which said articles may be transferred in both directions between said annular chamber and said deposition chamber means, and means to effect said transfer.

3,931,790

ANGLED CROSSFIRE RINSES

Helmut Franz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 159,746, July 6, 1971, Pat. No. 3,793,054. This application Aug. 9, 1973, Ser. No. 386,919

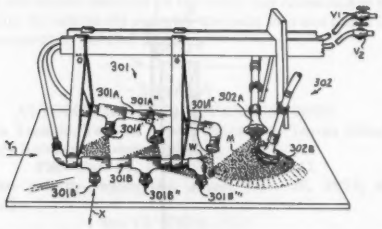
Int. Cl.² B05C *5/00*

U.S. Cl. 118—73 **14 Claims**

1. In the combination of a crossfire rinse set and a spray gun means for coating the surface of an article wherein the combination is of the type having means for moving the article in a downstream direction along an article movement path lying in a generally horizontal plane and the crossfire rinse set is of the type having a first rinse pipe means; a second rinse pipe means, means for mounting the first and second rinse pipe

means in spaced relation above the article movement path and upstream of the spray gun means so that the article moves past the crossfire rinse set and thereafter past the spray gun means; at least one nozzle mounted on each of the first and second rinse pipe means wherein each of the at least one nozzle directs a spray of rinsing medium downward toward the article movement path; and means for providing relative motion between the crossfire rinse set and the article moving means, the improvement comprising:

first means for mounting the at least one nozzle on the first rinse pipe means to apply the spray of rinsing medium (1) as a fan-shaped spray having an apex angle S and a centroidal axis, (2) at a first oblique angle to a first imaginary plane that is perpendicular to and transverse to the horizontal plane of the article movement path to define a first angle A that is measured between the first imaginary plane and the centroidal axis of the spray of the at least one nozzle mounted on the first rinse pipe means and is 90° plus one-half of the apex angle S of the spray of the at least one nozzle mounted on the first rinse pipe means to direct the rinsing medium away from the spray gun means in a generally upstream direction, and (3) at a second oblique angle measured between the centroidal



axis of the spray of the at least one nozzle mounted on the first rinse pipe means and a second imaginary plane that is perpendicular to the first imaginary plane and parallel to the horizontal plane of the article movement path to direct the rinsing medium spray toward a first side of the article movement path; and

second means for mounting the at least one nozzle on the second rinse pipe means to apply the spray of rinsing medium (1) as a fanshaped spray having an apex angle S and a centroidal axis, (2) at a third oblique angle to the first imaginary plane to define a second angle A that is measured between the first imaginary plane and the centroidal axis of the spray of the at least one nozzle mounted on the second rinse pipe means and is 90° plus one-half of the apex angle S of the spray of the at least one nozzle mounted on the second rinse pipe means to direct the rinsing medium away from the spray gun means in a generally upstream direction, and (3) at a fourth oblique angle measured between the centroidal axis of the spray of the at least one nozzle mounted on the second rinse pipe means and the second imaginary plane to direct the rinsing medium spray toward a second side of the article movement path opposite to the first side.

3,931,791

MECHANISM FOR APPLYING LACQUERS AND THE LIKE ON A PRINTING PRESS

Friedrich Preuss, Sprendlingen, and Kurt Difflipp, Dietzenbach, both of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Filed Sept. 5, 1974, Ser. No. 503,475

Claims priority, application Germany, Sept. 7, 1973, 2345183

Int. Cl.² B05C *1/02*

U.S. Cl. 118—236 **5 Claims**

1. For use with a sheet-fed printing press, means for applying a liquid coating material to a sheet following the printing thereof which comprises a main frame, a back-up cylinder journaled in the main frame, means including grippers for transferring a sheet to the back-up cylinder for transport thereon and for removing the sheet therefrom for delivery, a form cylinder journaled in the main frame in rolling engagement with the back-up cylinder, means for driving the cylinders and gripper means in unison, a fountain assembly including a fountain for the coating material, a fountain roller rotating therein adjacent the form cylinder, a first form roller adjacent the form cylinder, a dosing roller communicatingly interposed between the fountain roller and the first form roller, and a second form roller interposed between the fountain roller and the back-up cylinder, and means for selectively shifting the fountain roller and form rollers with respect to the main frame to (a) bring the fountain roller into exclusive liquid transmitting contact with the form cylinder, to (b) bring the first form roller into exclusive liquid transmitting contact with the form cylinder and to (c) bring the second form roller into exclusive liquid transmitting contact with the back-up cylinder thereby to change the length of the liquid transference path from the fountain to the sheet in accordance with the drying speed of the coating material and to insure evenly distributed liquid application of the coating material to the sheet.

3,931,792

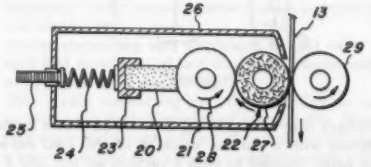
ABRASIVE LIQUID DEVELOPING APPARATUS

Masamichi Sato, Tokyo, Japan, assignor to Rank Xerox Ltd., London, England

Filed Feb. 1, 1974, Ser. No. 438,893

Int. Cl.² G03G *15/10*

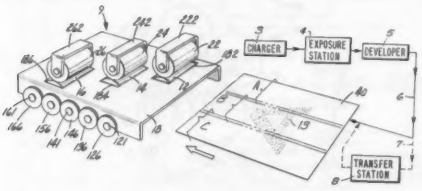
U.S. Cl. 118—637 **7 Claims**



1. A developing apparatus for making visible electrostatic latent images comprising a means for bringing a solid material comprising toner particles into contact with a coarse surface

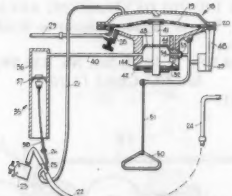
member, means for abrading said solid material, means for collecting said toner particles on the surface of a roller, means for contacting said surface with a carrier liquid, and means for bringing said carrier liquid containing toner particles into contact with a latent image bearing surface.

3,931,793
PRESSURE FIXING OF TONER POWDER IMAGES
James A. Kolibas, Broadview Heights, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio
Filed Feb. 4, 1974, Ser. No. 439,270
Int. Cl.² B05B *5/02*
U.S. Cl. 118—637 **3 Claims**



1. Apparatus for providing a permanent image on a substrate of substantial width, wherein the image is a fixed powder image of electroscopic toner powder, comprising means for fixing the toner powder image to said substrate, which means consists essentially of means establishing a feed path for the workpiece, a plurality of pairs of unheated pressure rollers disposed on parallel axes along said feed path and each having a contact nip, in which the contact nip of each pair of rollers is no more than about three inches in length, and thereby establishes a treatment track of its own width substantially narrower than the width of a workpiece to be treated, in which each roller pair is individually loaded, in which the pairs are offset and so disposed as to produce overlap between the treatment tracks of the roller pairs, and in which the pairs are sufficient in number and so arranged as to produce a complete uninterrupted pressure treatment area of the desired width as the workpiece is fed between the rollers.

3,931,794
MILKING MACHINES
Colin Andrew Chillingworth, Oaklands Park, Australia, assignor to Joan Mary Perkins and Glyn Andrew Frank Chillingworth, both of, Australia
Filed June 10, 1974, Ser. No. 477,838
Int. Cl.² A01J *05/04, 07/00*
U.S. Cl. 119—14.08 **4 Claims**



1. Pressure controlled milking termination means for use in conjunction with a milking machine of the kind having a vacuum pump coupled to both a vacuum air line and a vacuum milk line and a claw coupled to the milk line, by a flexible hose, comprising:

a diaphragm housing containing a diaphram sealably secured around its periphery to the housing,

a milk line vacuum communication conduit coupled to the milk line and terminating in the housing on one side of the diaphragm,

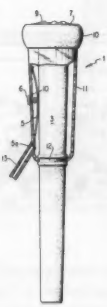
an air line conduit coupled to the air line and terminating in the housing on the other side of the diaphragm,

an air bleed aperture opening to atmosphere and in air flow communication with said other side of the diaphragm, the aperture being of sufficient dimension to reduce the vacuum effective on said other side,

a piston and cylinder assembly, a vacuum conduit extending between the cylinder and the diaphragm housing, and a flexible line depending from the piston coupled to the claw so that actuation of the piston within the cylinder lifts the claw,

and a diaphragm operated valve coupled to the diaphragm and operable to place said vacuum conduit into air flow communication with one of said vacuum lines upon reduction of air pressure on said one side of the diaphragm thereby effecting said actuation of the piston within the cylinder.

3,931,795
PULSATING TEAT CUPS
Lloyd P. Duncan, 814 Rainbow Drive, Washington, Mo. 65802
Filed July 11, 1974, Ser. No. 487,781
Int. Cl.² A01J *5/16*
U.S. Cl. 119—14.38 **17 Claims**

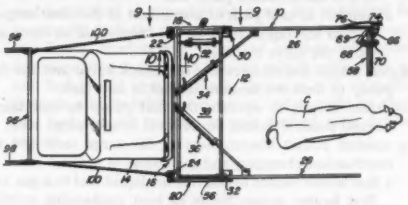


1. A teat cup comprising an outer substantially rigid shell of hollow construction and an inner resilient inflation, said inflation extending through said shell and the interior of said inflation being adapted to communicate with a source of reduced pressure, said shell being hermetically sealable at each end with respect to said inflation, said inflation being housed within the shell in spaced apart relationship, entrance means leading through said shell to the space between the shell and said inflation, said entrance means being connectable to a constant source of vacuum to reduce the pressure in said space, an aperture in said shell leading to a source of air and movable valve means within said space being associated with said inflation, said valve means being movable in one direction by the inflation in its flattened and collapsing condition to admit air through the aperture to said space, and said valve means being movable in a second direction to expose said entrance means whereby vacuum is established within said space permitting said inflation to return generally round shape and close said aperture, said valve means being periodically movable to vary the degree of vacuum within said space.

3,931,796
HYDRAULIC COW CATCH-CARRIER

Herbert F. Hoffman, Platte, S. Dak. 57369

Filed Dec. 31, 1974, Ser. No. 537,662
Int. Cl.² A01K 29/00
U.S. Cl. 119—151 16 Claims

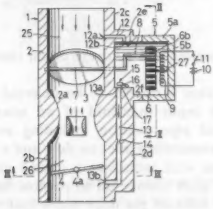


1. An animal catch-carrier, comprising, in combination:
a. a frame mountable on a vehicle, the frame including a back wall arrangeable adjacent to and transverse of the vehicle and spaced, substantially parallel side walls extending substantially perpendicularly from transverse ends of the back wall;
b. a pair of gates pivotally mounted each on a respective one of the side walls at points thereof spaced from the back wall, the gates arranged for swinging into planes substantially parallel to one another and to the back wall for forming an enclosure with the side walls and back wall; and
c. motor means mounted on the frame and connected to the gates for selectively swinging the gates into and out of the substantially parallel planes.

3,931,797
AUTOMOBILE ENGINE CARBURETORS

Toshiro Yoshida, Toyoda, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Nov. 21, 1974, Ser. No. 525,812
Claims priority, application Japan, Dec. 29, 1973, 49-4170[U]
Int. Cl.² F02M 1/12
U.S. Cl. 123—119 F 7 Claims

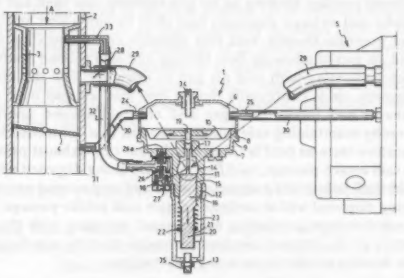


1. In an automobile engine carburetor comprising,
a main housing,
a choke valve provided in said main housing,
a venturi throat formed in said main housing and spaced below said choke valve,
a throttle valve provided in said main housing and spaced below said venturi throat,
an auxiliary housing connected to said main housing adjacent to said choke valve,
a coiled bimetallic strip provided in said auxiliary housing and associated with said choke valve to control the position of said choke valve automatically in response to variation in the temperature of the air in said auxiliary housing, and
means provided in said auxiliary housing for electrically heating said bimetallic strip,
the improvement which comprises,
a first air passageway having an inlet open into said main housing upstream of said venturi throat and an outlet open into said auxiliary housing,
a second air passageway having an inlet open into said auxiliary housing and an outlet open into said main housing downstream of said inlet of said first air passageway, the static pressure of said main housing being lower at said outlet of said second air passageway than at said inlet of said first air passageway, and
valve means provided in said auxiliary housing and adapted to close one of said first and second air passageways to stop the flow of fresh air into said auxiliary housing when said temperature is below a predetermined level, while opening said one air passageway upon elevation of said temperature to said predetermined level to resume said flow of fresh air through said auxiliary housing.

3,931,798
CONTROL DEVICE

Adrianus Johannes Theodorus Hoogeboom, Harmelen, Netherlands, assignor to Landi Den Hartog B.V., Groenekan, Netherlands

Filed Nov. 12, 1973, Ser. No. 415,271
Claims priority, application Netherlands, Nov. 10, 1972, 7215280
Int. Cl.² F02M 21/02
U.S. Cl. 123—120 11 Claims

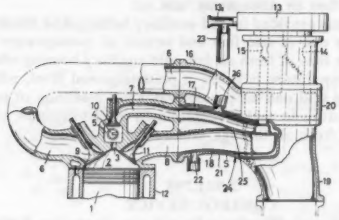


1. A control device for controlling the amount of gaseous fuel delivered from a source of fuel to an air suction conduit wherein said fuel is mixed with air, said conduit having a venturi tube and a throttle plate therein, comprising:
a. a housing, having a passage therethrough, said passage having one end connected to said source of fuel and the other end connected to said air suction conduit;
b. valve means disposed in said housing so as to selectively block said passage;
c. a flexible diaphragm affixed to and located with said housing so as to define a first chamber on one side of said diaphragm and a second chamber on an opposite side of said diaphragm;
d. means connecting said diaphragm to said valve means such that movement of said diaphragm causes said valve to open and close said passage;
e. first means connecting said first chamber to said air suction conduit downstream of said throttle plate such that when said throttle plate is closed or partially opened, a vacuum in said first vacuum chamber causes said valve means to partially close said passage so as to restrict the flow of fluel therethrough; and
f. second means connected to said housing to cause said valve means to open said passage when said throttle plate is fully opened.

3,931,799
ADIABATIC INTEGRAL INTAKE AND EXHAUST CONDUIT FOR INTERNAL COMBUSTION ENGINE

Hisashi Tamai, Tokyo, and Soichi Nakano, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 22, 1973, Ser. No. 372,747
Claims priority, application Japan, June 28, 1972, 47-76210
Int. Cl. F02b *19/10, 19/16*
U.S. Cl. 123—122 AB **1 Claim**

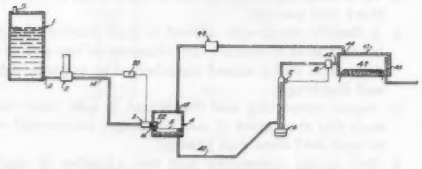


1. In an integral intake and exhaust conduit for an internal combustion engine of the type having a main and auxiliary combustion chamber, which conduit contains an intake passage and an exhaust passage wherein a portion of said exhaust passage is integrally formed with a portion of said intake passage to define a partition therebetween, an improvement comprising: a shell disposed about said intake passage and said exhaust passage forming an air gap between said shell and said intake and exhaust passages, said shell having a first and second aperture therein, said first aperture communicating with said air gap to allow air flow therein and said second aperture communicating with said air gap to allow air flow therefrom whereby air is continually drawn into said air gap over said exhaust and intake passages and out said second aperture thereby maintaining said integral conduit in a controlled temperature state as heat is transferred from said exhaust passage to said intake passage, said first aperture being disposed within said shell below said exhaust passage and said second aperture being disposed within said shell above said intake passage and a conduit communicating said second aperture with the air intake of the internal combustion engine thereby accelerating the heating of the air entering said engine.

3,931,800
SYSTEM TO CONVERT LIQUID FUEL TO GAS

Normond Gendron, 641 53rd St., West Palm Beach, Fla. 33407

Filed Nov. 27, 1974, Ser. No. 527,517
Int. Cl.² F02M *31/00*
U.S. Cl. 123—133 **4 Claims**

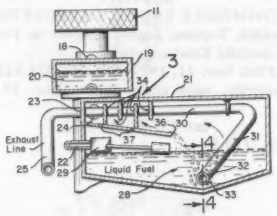


1. A fuel preheating system to convert liquid fuel to a gaseous state prior to injection into a combustion chamber comprising,
a fuel reservoir with an inlet and an outlet,
a surge tank with an inlet and an outlet,
first conduit means interconnecting the outlet of the fuel reservoir and the inlet of the surge tank,
a fuel pump in said first conduit means,
said surge tank including a one-way, normally closed check valve means to control the liquid level therein,
operator means for the check valve and fuel pump comprising,
a float in the surge tank constrained to vertical movement in a predetermined path, and
a member in said path of movement of the float responsive to the liquid level in the surge tank to open and close the valve means,
signal means interconnecting the check valve and the fuel pump to limit the amount of fuel in said tank;
operator means to operate the fuel pump to maintain a normal predetermined liquid level in said surge tank,
a conduit circuit interconnecting the surge tank and the combustion chamber, and including, in series,
a first heater means to convert the liquid fuel to a gas, said first heater means being in heat exchanging relation adjacent the exhaust of the combustion chamber,
a storage tank with an inlet and an outlet,
a normally closed gate valve intermediate the first heater means and the inlet of the storage tank, and
temperature responsive operator means to operate the gate valve, said temperature responsive operator means being affixed to said first heater means to sense the temperature at said first heater means.

3,931,801
FUEL VAPORIZER AND CONTROL SYSTEM

William L. Rose, 2114 Rhonda St., and Herbert J. Johnson, 1250 Bluebell St., both of Oxnard, Calif. 93030

Filed Feb. 21, 1974, Ser. No. 444,361
Int. Cl.² F02M *17/22*
U.S. Cl. 123—134 **7 Claims**



1. A fuel vaporizer and control system comprising, in combination:
a. a pipe section arranged to be inserted between the air intake and input manifold of an internal combustion engine, said pipe section including an air inlet valve means for controlling inlet air flow and a fuel vapor inlet;
b. a vaporizer unit including a closed chamber having a liquid fuel inlet connected to receive liquid fuel for said engine, an exhaust gas inlet and a fuel vapor outlet;
c. exhaust branch pipe means connected to pass exhaust gases from said engine to said exhaust gas inlet;
d. a liquid fuel reservoir in said chamber;
e. control means within said chamber to maintain the level of liquid fuel in said chamber at a given level;
f. exhaust pipe connecting means passing from said exhaust gas inlet through a portion of said chamber and thence extending into said liquid fuel to terminate beneath the surface of said liquid fuel, the terminal end of said connecting means beneath said liquid level including outlet means so that exhaust gases can only escape into said chamber by bubbling up through said liquid fuel;
g. separating means in said chamber, said fuel vapor outlet passing from said chamber at a point following the separating means and connecting into said fuel vapor inlet in said pipe section;

h. a throttle valve for controlling the flow of vaporized fuel into said fuel vapor inlet; and

i. control means connected to said throttle valve and air inlet valve means for controlling the flow of fuel and air respectively therethrough to provide a desired ratio of fuel vapor to air whereby hot exhaust gases pass through said exhaust pipe connecting means and bubble through said liquid fuel to vaporize the same, the vaporized fuel passing through the separating means to thereby remove any liquid droplets not vaporized so that substantially only vaporized fuel passes through said throttle valve into said fuel in said pipe section to then mix with air passing through said air inlet valve means and provide an explosive fuel and air mixture at said desired ratio for said engine.

3,931,802

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

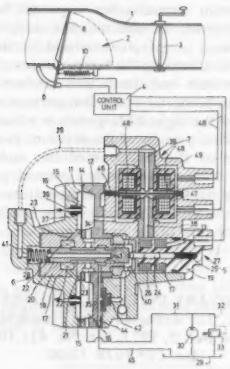
Konrad Eckert, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 12, 1973, Ser. No. 396,417

Claims priority, application Germany, Sept. 22, 1972, 2246546

Int. Cl.² F02M 39/00

U.S. Cl. 123—139 AW **22 Claims**



1. A fuel metering and injection system for regulating fuel flow so as to maintain a desired fuel-air mixture in a mixture compressing, externally ignited internal combustion engine, the system comprising, in combination;

a. an air intake suction tube of the internal combustion engine;

b. electro-mechanical means for measuring the quantity of air passing through said air intake suction tube;

c. pressure control means, responsive at least mediately to output from said electro-mechanical means for measuring, for generating as its output a variable fluid pressure head;

d. at least one fuel metering valve responsive to output from said pressure control means and having a movable member for metering out fuel, in desired proportion, to the quantity of air streaming through said suction tube in desired proportion, said movable member being actuated in two control directions.

3,931,803

FUEL QUANTITY MANIFOLD FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINES

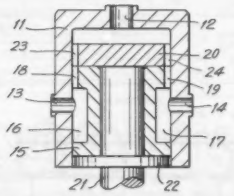
Asoke Chattopadhayay, Ulmenallee 134, 4041 Norf, and Wolfgang Müller, 4044 Kaarst, both of Germany

Filed Jan. 17, 1975, Ser. No. 541,920

Claims priority, application Germany, Jan. 18, 1974, 2363726

Int. Cl.² F02M 69/00

U.S. Cl. 123—139 AW **11 Claims**



1. In a fuel quantity manifold for multi-cylinder internal combustion engines, a cylindrically bored housing; two cylindrical dosing elements supported within said housing, said dosing elements each having end surfaces thereof in superimposed and mutual relative rotatable relationship; and metering passageways formed in each of said dosing elements having the end surfaced edges thereof in overlapping positions so as to provide a more or less large flow passage cross-section, the improvement comprising: said metering passageways each having, in the plane of the flow passage cross-section between said dosing elements, an approximately constant ratio of the wetted periphery to the diameter of an inscribed circle within the idling operating condition to at least the part-load operating condition of the engines in which one-third of the maximum flow passage cross-section is opened, said ratio being within the value of 6.0.

3,931,804

IGNITION CIRCUITS FOR INTERNAL COMBUSTION ENGINES

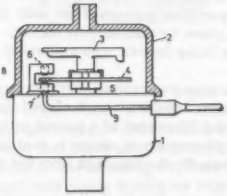
Dennis Dawes Bowen, Wilmslow, England, assignor to Bowpark Developments Limited, Wilmslow, England

Filed June 21, 1973, Ser. No. 372,174

Claims priority, application United Kingdom, June 22, 1972, 29223/72

Int. Cl.² F02P 1/00

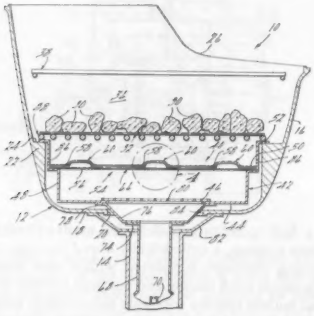
U.S. Cl. 123—148 E **6 Claims**



1. An internal combustion engine ignition system comprising a light source, a photo-electric pickup, a shutter moved at a rate proportional to the engine speed to periodically pass and interrupt light from said source to said pickup, amplifier means actuated by said pickup, means connecting said amplifier output to an ignition coil, a pulse-producing stage in said amplifier connected to said light source so as to momentarily increase the light output thereof to at least two times greater than normal each time light commences to fall on said pickup, and means for interrupting the amplifier output during said

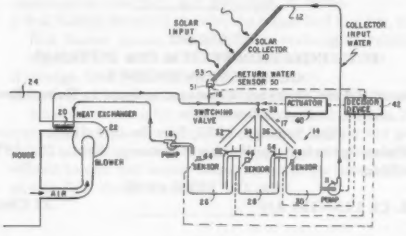
momentary light increase to thereby switch ignition coil current off with increasing light output.

3,931,805
BARBEQUE GRILL
David M. Nelson, Freeport, Ill., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.
Filed Aug. 21, 1974, Ser. No. 499,289
Int. Cl.² A47J 37/07
U.S. Cl. 126—41 R **2 Claims**



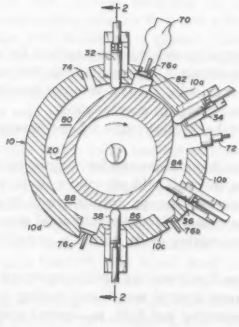
1. A pedestal mounted gas fueled barbeque grill comprising,
an open upper-ended housing having means defined by a first imaginary horizontal plane for supporting a cooking grate,
a burner enclosure disposed within said housing,
said enclosure including a bottom wall portion and a peripheral side wall
means within said housing defined in part by a second imaginary horizontal plane spaced vertically below said first mentioned plane engageable with said enclosure for supporting said enclosure within said housing,
said burner enclosure being provided with support means defined by a third imaginary horizontal plane spaced vertically below said second mentioned plane,
a burner assembly supported upon said support means,
means defining a fuel-air mixture inlet opening in said bottom wall portion of said burner enclosure and baffle means interposed between said opening and said burner assembly, whereby an air-fuel mixture supplied through a pedestal supporting said grill and introduced through said opening will be dispersed in a uniform manner towards the underside of said burner assembly,
said burner assembly comprising a generally horizontally disposed partition supported at said third mentioned imaginary plane by said support means,
said partition being formed with a plurality of spaced apart openings,
a plurality of open lower sided, generally cup-shaped burner units associated one with each of said openings,
said units being fabricated of a porous screen material and being complementary in shape to said openings and extending upwardly therethrough from the underside of said partition,
each of said burner units including a peripheral flange portion engaged with and secured to the underside of said partition around the periphery of the associated of said openings,
a layer of a porous wire screen of a smaller mesh size than said burner units disposed below said partition and being generally co-extensive therewith between said support means, and
a support grate supported in a position generally coplanar of said second mentioned imaginary plane and having a layer of rock-like material supported thereon for catching any excess food drippings or the like which may be produced when food is being cooked on said first mentioned grate and thereby minimize the transfer of such drippings toward said burner assembly.

3,931,806
METHOD AND APPARATUS FOR STORING A MEDIUM HEATED BY SOLAR ENERGY
Thomas Edward Hayes, Goshen, Ind., assignor to Johnson Service Company, Milwaukee, Wis.
Filed May 6, 1974, Ser. No. 467,400
Int. Cl.² F24J 3/02
U.S. Cl. 126—400 **18 Claims**



17. In a heating system having a medium for storing heat and heating means for heating the medium, a method of storing heat in the medium comprising storing portions of the medium at different temperatures to permit heating of the portions independently of one another, supplying medium stored at the lowest temperature to said heating means for heating the medium, sensing the temperatures of the portions of the stored medium and the heated medium, causing the heated medium to be stored with a first portion of the medium which is stored at the highest temperature whenever the temperature of the first portion of the medium is nearest below the temperature of the heated medium, and causing the heated medium to be stored with a second portion of the medium which is stored at a lower temperature whenever the temperature of the second portion of the medium is nearest below the temperature of the heated medium.

3,931,807
ROTARY INTERNAL ENGINES
Abraham Bloom, 721 Arlington Ave., Plainfield, N.J. 07060
Filed Dec. 3, 1973, Ser. No. 421,100
Int. Cl.² F02B 53/00
U.S. Cl. 123—8.05 **8 Claims**



1. A rotary internal combustion engine designed to operate on a six-phase cycle which includes intake, compression,

combustion, after burn, adiabatic expansion, and exhaust phases; said engine comprising a stator, a rotor mounted for rotation within said stator and defining a space therebetween, said rotor having a substantially semi-elliptical cross section, a shaft on which said rotor is mounted for rotation of said rotor relative to said stator, said shaft being mounted for concentric rotation relative to said stator, four spring-loaded, sliding abutments dividing said space into four working chambers, the volume of said four working chambers varying between a predetermined minimum and a predetermined maximum as said rotor rotates, said four working chambers including:

a. a first working chamber serving as an intake chamber and including a fuel-air mixture intake port and an associated check valve, a first one of said spring-loaded, sliding abutments mounted for continuous sealing engagement with said rotor and being located at the leading end of said first working chamber;

b. a second working chamber serving as a combustion chamber and including an opening adapted to receive a spark plug, a second one of said spring-loaded, sliding abutments being arranged to separate said first and second working chambers;

c. a third working chamber serving as an after burn chamber and including an air-intake port and an associated check valve, a third one of said spring-loaded, sliding abutments being arranged to separate said second and third working chambers;

d. a fourth working chamber serving as an adiabatic expansion chamber and including an air-intake port and an associated check valve, and an exhaust port adapted to act as a common exhaust port for said second, third and fourth chambers, a fourth one of said spring-loaded, sliding abutments arranged to separate said third and fourth working chambers;

e. said second, third and fourth spring-loaded, sliding abutments each having associated therewith an automatic hold-release mechanism operative to automatically hold the associated sliding abutment in a hold position out of engagement with said rotor on alternate revolutions of said rotor and to automatically release the associated sliding abutment into a release position in sealing engagement with said rotor on alternate revolutions of said rotor, said second sliding abutment arranged to be in said hold position when said third and fourth sliding abutments are in said release position during one revolution of said rotor, and said second sliding abutment arranged to be in said release position when said third and fourth sliding abutments are in said hold position during the next revolution of said rotor.

3,931,808

ALTITUDE COMPENSATION SYSTEM FOR A FUEL MANAGEMENT SYSTEM

Todd Leonard Rachel, Yorktown, Va., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 23, 1974, Ser. No. 535,399
Int. Cl.² F02D *1/04;* **F02B** *3/00*
U.S. Cl. 123—32 EA **10 Claims**

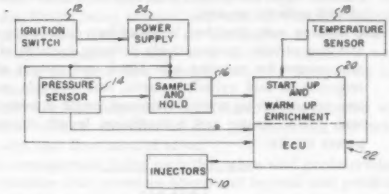
1. In a fuel management system for an internal combustion engine an altitude compensation system for adjusting the amount of fuel supplied to the engine for a period of time dependent upon engine temperature, said altitude compensation system comprises:

ignition switch means for initiating the starting of the engine;

a temperature sensing means for sensing the operating temperature of the engine and generating an electrical signal in response thereto;

air pressure sensing means responsive to the ambient air pressure of the engine and responsive to said ignition switch means for generating an electrical signal representing the ambient air pressure when said switch means is actuated;

fuel enrichment means responsive to said electrical signal from said temperature sensing means for increasing the amount of fuel supplied to the engine until said engine temperature reaches a predetermined value; and



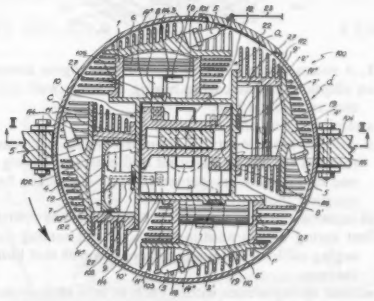
control circuit means responsive to said ignition switch means for receiving and storing said electrical pressure signal from said air pressure sensing means and operative to apply said electrical pressure signal to said fuel enrichment means for modifying the amount of fuel supplied to said engine in accordance with ambient air pressure until said engine temperature reaches a predetermined value.

3,931,809

ROTARY INTERNAL COMBUSTION ENGINE

Francisco Barcelloni Corte, Corrientes 2021, and Pablo Bianco, Av. Pte. Julio A. Roca 610, both of Buenos Aires, Argentina

Filed Oct. 3, 1973, Ser. No. 402,978
Int. Cl.² F02B *57/00, 57/06*
U.S. Cl. 123—43 R **4 Claims**



1. In a rotary internal combustion engine of the type which includes a fixed engine frame, a block rotatable about a block axis, an output shaft rotatable about a shaft axis, said shaft axis being offset from said block axis to define an eccentricity, at least one cylinder means including a cylinder housing, a piston and a drive rod, said piston having an edge surface slidably engaging said cylinder housing, said drive rod being connected to said piston, said cylinder means having a cycle including a power stroke, means for supplying a combustible mixture to said cylinder means, and ignition means for igniting said combustible mixture in said cylinder means, an improved means for driving said output shaft comprising, in combination:

a housing within said block and rotatable about said one block axis, said housing having at least a pair of opposing walls and substantially enclosing said output shaft, said housing defining a lubricant reservoir for said rotary engine;

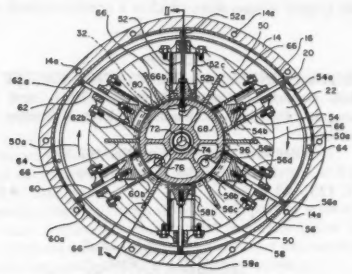
a key member rigidly secured to said output shaft;
a yoke member slidably engaging said opposing walls of said housing, said key member slidably engaging said yoke member, said yoke member being rotatable substantially about said shaft axis; and
means for connecting said drive rod and said yoke member to define a connection point, said connection point being radially offset from said block axis throughout said cycle of said cylinder means;
said housing, yoke member, key member, connecting means and eccentricity cooperatively defining variable moment arm means for rotating said block and output shaft in response to said cylinder means, said variable moment arm means having a predetermined length at initiation of said power stroke and a maximum length during said power stroke.

3,931,810

ROTARY-PISTON INTERNAL COMBUSTION ENGINE

Wendell H. McGathey, 374 George St., P.O. Box 745, Fredericton, New Brunswick, Canada

Filed Sept. 27, 1973, Ser. No. 401,457
Claims priority, application Canada, July 6, 1973, 175899
Int. Cl.² F02B *57/00*
U.S. Cl. 123—44 E **6 Claims**



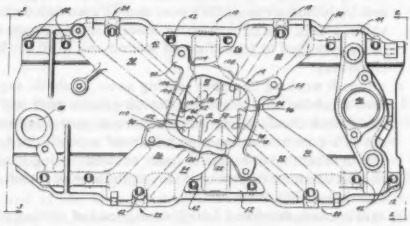
1. A rotary-piston internal combustion engine comprising:
an elliptical engine casing having an inner wall and a central, cylindrical hub;
a retaining ring affixed to said hub;
a circular block centrally mounted within said casing for rotation therein and around said hub, and having at least one radial cylinder adapted to receive a piston for reciprocation therein;
at least one sealing vane on each side of said cylinder;
first spring means abutting each of said sealing vanes for urging each of said sealing vanes towards said hub to ride thereon;
second spring means within each of said sealing means for urging each of said sealing vanes towards said retaining ring to ride thereon;
a first pair of sealing rings mounted in said block adjacent to each of said vanes, each pair of sealing rings being spring urged to ride against said retainer ring and the wall of said elliptical casing respectively, said vanes and sealing rings preventing leakage of fuel vapor and combustion gases from said cylinder;
a vent in said cylinder block between said cylinders communicating at one end with the space between adjacent sealing vanes and at its other end with means connected to an intake manifold associated with said engine;
a second pair of sealing rings on each side of said port, mounted in said block and being spring urged against the wall of the elliptical casing;
a piston, disposed within said radial cylinder, having an associated push rod projecting therefrom toward said casing, said push rod terminating in a bearing adapted to be restrained against the inner wall of said casing;
an igniting means provided in said hub in radial alignment at or near the conjugate axis of said elliptical casing;
a fuel intake port and an exhaust port provided in said hub substantially opposite said igniting means, said fuel intake port and said exhaust port being approximately equidistant from the conjugate axis of said elliptical casing; and
central drive shaft means within said hub on which said cylinder block is mounted, for rotation therewith.

3,931,811

INDEPENDENT RUNNER INTAKE MANIFOLD FOR A V-INTERNAL COMBUSTION ENGINE HAVING EACH RUNNER IN A DIRECT PATH WITH A THROAT OF A FOUR-THROAT CARBURETOR

James D. McFarland, Jr., Chatsworth, Calif., assignor to Edelbrock Equipment Co., El Segundo, Calif.

Continuation-in-part of Ser. No. 130,329, April 2, 1971, Pat. No. 3,744,463, which is a division of Ser. No. 280,295, Aug. 14, 1972, abandoned. This application Dec. 23, 1974, Ser. No. 535,284
Int. Cl.² F02B *75/18*
U.S. Cl. 123—52 M **14 Claims**



6. An improvement in a manifold for use in a carbureted internal combustion engine, the improved manifold comprising:
a. a base;
b. a plenum body above the base defining a plenum chamber with a generally rectangular entrance, the plenum chamber being oriented at an acute angle to a bisecting plane through the longitudinal centerline of the manifold and with the sides of the entrance at an acute angle to the bisecting vertical plane; and
c. independent runners leading from the plenum chamber to exits from the runners in the base disposed for communicating the runners with the inlet ports of the engine, each runner having a quadrilateral flow cross section, and each runner being laid over from its entrance and along a length thereof with the roof of the runner further from the bisecting plane than the floor in any flow cross section in the laid over portion of the runner.

3,931,812

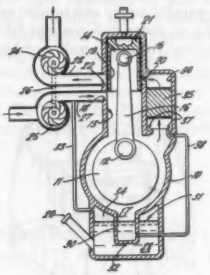
INTERNAL COMBUSTION ENGINES

Herbert Edward Ashfield, and Charles Hartley Hull, both of Huddersfield, England, assignors to David Brown Tractors Limited, Huddersfield, England

Filed Aug. 13, 1973, Ser. No. 387,738
Claims priority, application United Kingdom, Sept. 6, 1972, 41233/72
Int. Cl.² F02B *33/04*
U.S. Cl. 123—73 S **6 Claims**

1. A multi-cylinder 2-stroke injection engine of the crankcase compression type comprising inlet, transfer and exhaust ports in each cyliner; a scavenge compressor including a turbine connected to the engine's exhaust ports and an impeller connected to the engine's inlet ports; a pressurized lubrication system including a sump containing oil under a pressure greater than atmospheric for forcing oil from the sump to

lubricate the moving parts of the engine; means defining a separate crank chamber for each cylinder projecting below the level of oil in the sump; a transfer passage connecting each crank chamber to the transfer port in the associated cylinder;



and means on each chamber defining means providing an opening communicating each of said chambers with said sump for permitting oil to return from each crank chamber to the sump below said level.

3,931,813

EXHAUST GAS RECIRCULATION CONTROL DEVICE

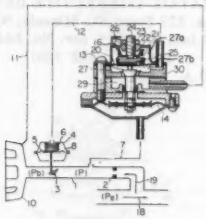
Masakazu Horie, Tokyo; Takao Fukuhara, and Tetsuya Harada, both of Yokohama, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed July 25, 1973, Ser. No. 382,291

Claims priority, application Japan, July 26, 1972, 47-74798

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **4 Claims**



1. An exhaust gas recirculation control device for use in an internal combustion engine having an intake manifold, an exhaust pipe and an exhaust gas recirculation pipe connecting said intake manifold to said exhaust pipe, said control device being operatively connected to said recirculation pipe and comprising:

an exhaust gas flow restrictor in said recirculation pipe;

an exhaust gas flow control valve mounted downstream of said restrictor;

a pressure responsive membrane arranged to communicate with said recirculation pipe between said restrictor and said flow control valve to respond to pressure generated therebetween;

a housing divides into a first chamber having an air bleed hole and a second chamber by a wall having a valve seat;

a valve normally seated on said valve seat to block communication between the first and second chambers, and fixedly connected to said pressure responsive membrane, said valve being biased by a spring, the stiffness of said spring being selected such that when a predetermined pressure is reached to act on said pressure responsive membrane, said spring yields and said valve begins to open, and when the pressure acting on said pressure responsive membrane gradually increases above and beyond said predetermined pressure, the degree of opening of said valve is gradually increased;

a diaphragm having a hole, disposed within the first chamber and dividing the first chamber into an atmospheric chamber communicating with the atmosphere through the air bleed hole and a vacuum chamber communicating with said atmospheric chamber through the hole, said diaphragm being engaged with said valve, said diaphragm preventing transmission of oscillations in the level of intake manifold vacuum to a vacuum responsive membrane and said flow control valve by dampening said oscillations;

a said vacuum responsive membrane communicated with said vacuum chamber of said first chamber and linked with said flow control valve;

the arrangement being such that when said predetermined pressure and pressures above and beyond said predetermined pressure act on said pressure responsive membrane, said valve leaves said valve seat causing intake manifold vacuum to communicate through said valve with said vacuum chamber of said first chamber and said air bleed hole and when air sucked through said air bleed hole reaches a predetermined maximum flow level, said intake manifold vacuum acts on said vacuum responsive membrane to open said flow control valve in dependence on the pressure level acting on said pressure responsive membrane.

3,931,814

CYLINDER-INDUCTION RESPONSIVE ELECTRONIC FUEL FEED CONTROL CARBURETORS

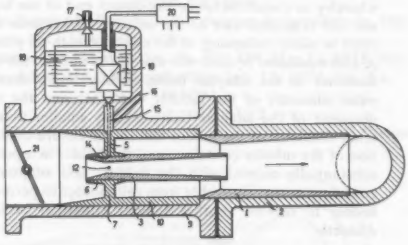
Jean-Pierre Rivere, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Aug. 27, 1973, Ser. No. 391,796

Claims priority, application France, Sept. 28, 1972, 72.34360

Int. Cl.² F02B *33/00*

U.S. Cl. 123—119 R **6 Claims**



1. An electronically controlled carburetor for supplying fuel to cylinders of an internal combustion engine, said carburetor comprising:

a float chamber having a single outlet passage,

a doubled venturi including a central venturi having a neck,

an electromagnetic valve, disposed within the float chamber, for selectively opening and closing the outlet passage,

an emulsion tube defining a passage fluidly connecting said outlet passage to the neck of said central venturi,

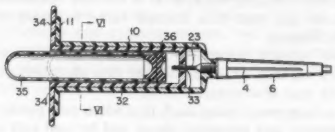
a passage for air connected to said emulsion tube passage, and

an electronic computer for opening said electromagnetic valve in synchronism with the induction phase of the cylinders of an internal combustion engine.

3,931,815
ASSEMBLY HAVING AN ADAPTER AND A HOLDER WITH A DOUBLE ENDED NEEDLE

Nobuyuki Takatsuki, Tokyo, Japan, assignor to Jintan Terumo Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 392,565, Aug. 29, 1973, abandoned.
This application Jan. 2, 1975, Ser. No. 538,152
Int. Cl.² A61B 5/14
U.S. Cl. 128—2 F **1 Claim**



1. A multiple sampling assembly comprising:

a tubular container having a closed end and an open end to which a stopper is sealingly attached;

a tubular container holder having an open end receiving said container, and a closed end to which a double-ended needle is fitted, one end of the needle being projected into the interior of the holder for piercing through the stopper into the interior of the container and the other end projected outside the holder;

a self-recoverable elastic sheath enveloping said one end of the needle and serving as a seal against the passage of a liquid from a vein, but being pierceable by the one end of the needle when the container is positioned for injection or sampling; and

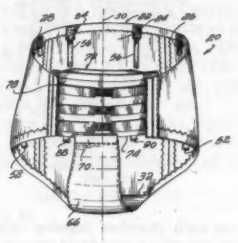
a substantially cylindrical adapter detachably and slidably inserted in the holder receiving and keeping said tubular container substantially coaxial with said holder, said adapter having open and restricted ends, a plurality of circumferentially spaced ribs on the outer periphery thereof, an opening extending centrally through said restricted end and dimensioned to freely receive said one end of the needle and the elastic sheath therethrough, and means limiting the insertion of the adapter into the holder to a predetermined position relative to the holder, whereby to ensure between the closed end of the holder and the restricted end of the adapter a clearance sufficient to allow collapsing of the elastic sheath on piercing of said container by said one end of the needle, the inner diameter of the adapter being slightly larger than the outer diameter of the tubular container and the outer diameter of the adapter being slightly smaller than the inner diameter of the holder thereby to ensure the insertion of the tubular container into the holder in a position substantially coaxial with the holder, said adapter and container being removable from said holder to permit the holder to receive another tubular container of larger diameter.

3,931,816
ADJUSTABLE ANTIPTOSIS CORSET

Jacobo Waldmann, 77 Espejo St., Mendoza, Argentina

Filed Jan. 7, 1975, Ser. No. 539,104
Int. Cl.² A61F 5/02
U.S. Cl. 128—78 **6 Claims**

1. An adjustable antiptosis corset to support viscera in general, to compensate distention, lowering, as well as slackness of muscles, tendons and ligaments supporting the stomach, intestine, kidney, womb and the like organs of the human being, in order to correct fallen stomachs and the like, comprising a resilient fabric member to cover the rear and sides of part of the trunk of the wearer, and having a central portion and two side portions, said central portion being resilient in a generally vertical direction and said side portions being resilient in a generally horizontal direction with regard to the longitudinal axis of the human being, upon the corset being worn by the wearer, each side portion defining an outer substantial vertical edge, parallel clasp tape members projecting away at right angles from said outer edges, said central portion having a horizontal lower edge substantially perpendicular to said outer edges, a substantially trapezoidal ventral pocket member, having parallel larger and smaller edges, said pocket member including an outer non-resilient fabric wall member and an inner non-resilient fabric wall member linked together

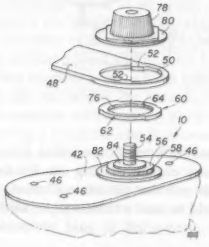


by their edges with the exception of the smaller edges which define top access opening to the pocket formed by said fabric wall members, the said outer fabric wall member having an outer face provided with clasp linking means for said clasp tapes, and an inner face on which a pair of spaced apart, from bottom to top diverging whale-bone-like reinforcing members are mounted, said whale-bone-like reinforcing members diverging towards said top access opening, said inner non-resilient fabric wall member having parallel whale-bone-like reinforcing members which are parallel to said parallel edges.

3,931,817
PEDIATRIC CORRECTIVE DEVICE

Leonard Infranca, 222 Front St., Mineola, N.Y. 11501

Filed Jan. 27, 1975, Ser. No. 544,410
Int. Cl.² A61F 3/00
U.S. Cl. 128—80 A **4 Claims**



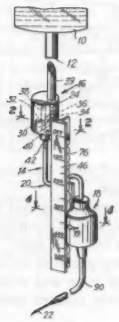
1. A pediatric corrective device adapted to be attached to the soles of a patient's shoes so as to confine twisting traverses of said patient's legs to within selected limits, said device comprising a bar having an operative position connected in spanning relation between said shoes and having adjacent each end an opening therein with a stop projection on a wall bounding each said opening, a plate for attachment to each said shoe, a threaded member extending perpendicularly of each said plate defining the axis for said permissible twisting traverses of said shoe, each said threaded member having an operative position projected centrally through one of said end openings, respectively of said bar, a circular member fixedly mounted to each said plate at the base of said threaded member having teeth along its perimeter in encircling relation about said threaded member, and ring-like traverse-limiting members having inner and outer wall surfaces positionable in

the clearance between each said circular member and said wall bounding said bar end opening, each of said traverse-limiting members having at least one traversing slot of a selected length in said outer wall surface for receiving said stop projection in projected position therein to thereby allow traversing movement until abutment by said bar stop with the opposite end walls bounding said traversing slot, and teeth along said inner wall surface of said traverse-limiting member to provide meshing engagement with said peripheral teeth of said circular member, whereby said meshing engagement holds said traversing slot in any selected traverse-limiting relation to said bar stop and enables adjustments therein merely by changing said teeth that establish said meshing engagement.

3,931,818
LIQUID ADMINISTRATION APPARATUS

Michael Goldowsky, 222 Marthling Ave., Tarrytown, N.Y. 10591

Filed July 22, 1974, Ser. No. 490,777
Int. Cl.² A61M *5/14*
U.S. Cl. 128—214 C **11 Claims**

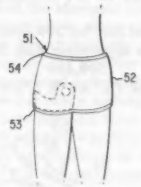


1. An administration set for the infusion of a supply liquid in a supply container into a separate liquid system comprising means for forming an access for liquid flow from the container, sump means having an air space and for providing an intermediate reservoir and flow of liquid, float chamber means for controlling liquid flow from said sump means, metering flow means for providing a conduit for said liquid from said sump means to said float chamber means and moveable support means for said float chamber means for maintaining a substantially constant head of fluid between said sump means and said float chamber means, infusion tubing for conducting liquid from said float chamber means to said separate liquid system, said metering flow means including first and second fluid passages for simultaneous liquid and air flow respectively at an air pressure other than atmospheric to eliminate substantial pressure differentials between said sump means and said float chamber means during delivery of said liquid to said separate liquid system and said second fluid passage extending into said sump means in communication with said air space, whereby as said supply container empties, the flow rate through said metering flow means remains substantially constant.

3,931,819
DRAINAGE BAG FOR HUMAN BODY

Rosemary B. Weedle, Grafton, Va., assignor to Phillip M. Weddle, Grafton and Auzville Jackson, Jr., Richmond, both of, Va., a part interest to each

Continuation of Ser. No. 398,382, Sept. 18, 1973, abandoned. This application Jan. 30, 1975, Ser. No. 545,352
Int. Cl.² A61F *5/44*
U.S. Cl. 128—283 **10 Claims**



1. A drainage bag for attaching around a drainage opening in the human body and to be worn adjacent the skin comprising:

a soft layer of the peripheral dimensions of the drainage bag and having an opening therein,

a back plastic layer of the peripheral dimensions of the drainage bag and having an opening therein affixed to said soft layer to be coextensive therewith and having its opening coaxial with said soft layer opening,

a front plastic layer of the peripheral dimensions of the drainage bag and sealed about its periphery to said back plastic layer on the side of said back plastic layer not laminated to said soft layer,

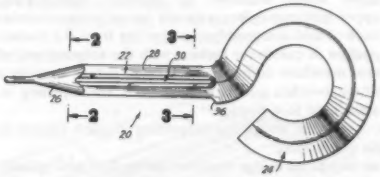
a sealing washer on the back side of said drainage bag having an opening therein, and

a seal between the area surrounding said seal washer opening and the area surrounding said back plastic layer opening.

3,931,820
LUMEN REAMER

Louis Bucalo, Holbrook, N.Y., assignor to Investors in Ventures, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 359,429, May 11, 1973, Pat. No. 3,815,578. This application Apr. 18, 1974, Ser. No. 461,981
Int. Cl.² A61B *17/22*
U.S. Cl. 128—304 **7 Claims**



1. A reamer, particularly for removing mucosa from the lumen of a tubular body organ, comprising an elongated hollow, substantially rigid reaming portion and handle means fixed to and extending from said reaming portion at a rear end region thereof, said reaming portion having a free front end region distant from said rear end region thereof, having a central axis, being of a polygonal cross section, and including a plurality of substantially rigid, flat walls distributed about and extending parallel to said axis, said walls being stationary with respect to each other and being integral with said front free end portion, said reaming portion being formed with a

plurality of slots extending parallel to said axis rearwardly of said front free end portion at locations where said walls would intersect if said slots were not present, and said walls having at said slots reaming edges which remove a material such as mucosa with the material entering through the slots into the interior of the reaming portion.

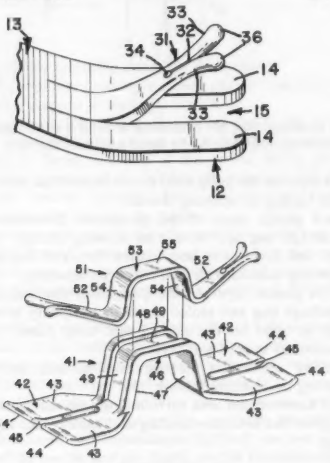
3,931,821
SUTURE BRIDGE

Harold D. Kletschka, and Edson H. Rafferty, both of Minneapolis, Minn., assignors to Bio-Medicus, Inc., Minnetonka, Minn.

Continuation-in-part of Ser. No. 309,466, Nov. 24, 1972, Pat. No. 3,831,608. This application Aug. 26, 1974, Ser. No. 500,689

Int. Cl.² A61B *17/04*

U.S. Cl. 128—335 **24 Claims**



1. A surgical bridge for supporting incision sutures under tension comprising:

a. an elongated lower bridge member having first and second foot portions joined by a bridge portion constructed to bridge an incision, the foot portions being constructed to engage the surface of a patient's skin on opposite sides of the incision;

b. an elongated upper bridge member having first and second arm portions joined by a connecting portion;

c. and means associated with at least one of said lower and upper bridge members for mateably interlocking the upper bridge member with the lower bridge member;

d. each of said arm members extending from the connecting portion in cantilever fashion with the extreme end of the arm members defining an elevated suture support point which overlies and is spaced from said opening in the associated foot portion.

14. A surgical bridge for supporting incision sutures under tension comprising:

a. an elongated bridge member having first and second foot portions joined by a bridge portion constructed to bridge an incision, the foot portions being constructed to engage the surface of a patient's skin on opposite sides of the incision;

b. each of said foot portions having an opening through which a suture may pass;

c. first and second arm members for the first and second foot portions, respectively, each arm member extending longitudinally from the bridge portion in cantilever fashion with its extreme end defining an elevated suture support point which overlies and is spaced from said opening in the associated foot portion;

d. at least one of said arm members defining a suture tying device, comprising

1. a bifurcating slot extending longitudinally from the end of the arm member to an inner point thereof to define a pair of leg members, the leg members being resiliently movable relative to each other and capable of being squeezed together;

2. an aperture formed through the arm member at said inner point and communicating with the bifurcating slot, the aperture having a lateral dimension greater than the smallest lateral dimension of the slot, whereby the aperture remains open with the resilient leg members squeezed together;

3. and said leg members defining a region of laterally reduced outer dimension between said inner point and said end, whereby said suture length can be wrapped around the leg members as said reduced area to squeeze the leg members together.

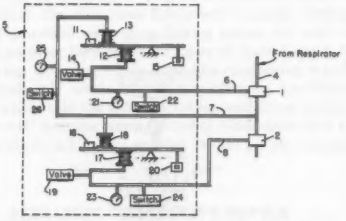
3,931,822
AUTOMATIC ALTERNATING CUFF ENDO TRACHEAL TUBE INFLATOR

Frank N. Marici, 2 Mineola Ave., Roslyn, N.Y. 11576

Filed Feb. 26, 1974, Ser. No. 446,057

Int. Cl.² A61M *16/00*

U.S. Cl. 128—351 **11 Claims**



1. An alternating cuff endo-tracheal tube including,

an endo-tracheal tube,

at least two cuffs surrounding said endo-tracheal tube,

each of said cuffs capable of forming an air tight seal against the trachea when inflated, and

a control unit sensing pressure in each of said cuffs and in said endo-tracheal tube and controlling the pressure in both said cuffs, said control unit including, for each of said cuffs,

a moveable member urged in one direction to pressurize the associated cuff,

means responsive to pressurization of said endo-tracheal tube to further urge said moveable member in said one direction to increase pressure in said associated cuff,

and deflating means, when energized, to urge said moveable member in said other direction to deflate said associate cuff, and

timing means, when activated to energize and deenergize both said deflating means alternately and in sequence.

3,931,823
CANE SEPARATOR FOR HARVESTING MACHINE

Charles G. Burton, Lewiston, N.Y., assignor to Chisholm-Ryder Company, Inc., Niagara Falls, N.Y.

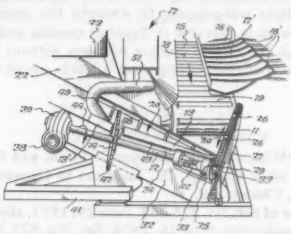
Filed Jan. 17, 1973, Ser. No. 324,545

Int. Cl.² A01D *46/00*

U.S. Cl. 130—30 R **9 Claims**

1. A cane separator for a grape harvesting machine comprising a first conveyor for receiving harvested material including grapes and cane, said first conveyor having first and second opposite sides, a second conveyor oriented transversely to said first conveyor to provide a junction therewith, said second conveyor having third and fourth opposite sides, said first conveyor terminating proximate said third side and being above said second conveyor at said junction so as to cause said second conveyor to receive grapes dropped on it

from said first conveyor, and cane removing means positioned beyond said junction and above said second conveyor for engaging and removing cane which passes beyond said junction, said cane removing means including first and second cane engaging means, said first cane engaging means being located proximate said fourth side, and said second cane



engaging means extending across said second conveyor and being oriented substantially lengthwise of said second side, said second side being located upstream of said first side in relation to the direction of movement of said second conveyor, and driving means for driving said cane engaging means.

3,931,824
SMOKING MATERIALS

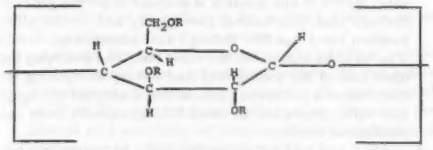
Ralph R. Miano, and Charles H. Keith, both of Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 395,500, Sept. 10, 1973, abandoned, which is a continuation of Ser. No. 52,725, July 6, 1970, abandoned, which is a continuation-in-part of Ser. No. 774,834, Nov. 1, 1968, abandoned, which is a continuation-in-part of Ser. No. 696,699, Jan. 10, 1968, abandoned. This application Feb. 14, 1975, Ser. No. 550,081

Int. Cl.[2] A24B *15/00*; A24D *1/18*

U.S. Cl. 131—2 **19 Claims**

10. A smoking material comprising a combustible organic material and a particulate inorganic filler, said combustible organic material consisting essentially of one or more cellulose derivatives, their salts and mixtures thereof having the recurring anhydroglucose unit:



wherein at least one R is selected from the group consisting of lower alkyl, carboxy lower alkyl, hydroxy lower alkyl groups and mixtures thereof; and the remaining Rs are hydrogen and the average degree of substitution is from about 0.2 to 3.0; said combustible organic material and said particulate inorganic filler being present in a weight to weight ratio of from about 85:15 to about 15:85.

3,931,825
METHOD FOR TREATING TOBACCO

Leonard T. DeCoursey, Hardinsburg, Ky., assignor to John Mohr & Sons, Chicago, Ill.

Filed Dec. 19, 1973, Ser. No. 426,112

Int. Cl.[2] A24B *1/02*, *3/02*, *3/04*, *3/12*

U.S. Cl. 131—140 A **9 Claims**

1. In a method of moistening compressed tobacco the steps of:

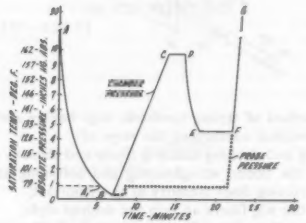
subjecting compressed tobacco containing substantial quantities of non-condensibles to an absolute pressure below the flash point of the non-condensibles,

thereafter, and commencing at a time when said tobacco is subjected to a first low absolute pressure, passing steam generally radially inwardly only through the tobacco throughout substantially the entire height of the tobacco and simultaneously withdrawing unused steam and non-condensibles from the central zone of said tobacco,

controlling the steam flow to the tobacco in such fashion that the temperature of the tobacco does not exceed a pre-determined maximum, the tobacco being maintained at a substantially constant pressure for a period of time at the end portion of the aforesaid controlled steam flow,

terminating the steam flow after substantially the entire mass of tobacco has attained the pre-determined maximum temperature and the absolute pressure of the system has increased to a level substantially corresponding to said temperature but below atmospheric,

lowering the absolute pressure from the pressure existing while the mass of tobacco was subjected to the pre-determined maximum temperature to an absolute pressure above the initial low absolute pressure,



subjecting the tobacco at the last mentioned pressure to steam which is passed generally radially inwardly only through the tobacco throughout substantially the entire height thereof and simultaneously withdrawing unused steam and non-condensibles from the central zone of said tobacco, the tobacco being maintained at a substantially constant pressure for a period of time near the end portion of the last mentioned subjection to steam, and, upon conclusion of the subjection of the tobacco to the last mentioned steaming,

thereafter raising the pressure to which the interior and exterior of the mass of tobacco is subjected to atmospheric pressure.

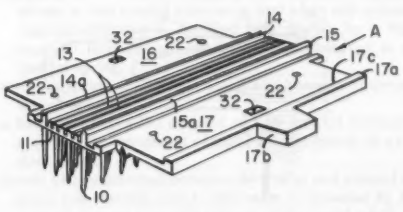
3,931,826
BRUSH AND METHODS FOR MANUFACTURING SAME

Howard R. Moon, Fort Atkinson, Wis., assignor to Wahl Clipper Corporation, Sterling, Ill.

Filed July 26, 1974, Ser. No. 492,234

Int. Cl.[2] A45D *1/00*

U.S. Cl. 132—9 **19 Claims**

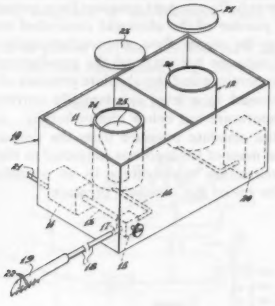


1. A brush element comprising a center section having an arcuate cross section, a plurality of spaced teeth extending from the outside of said section, and means for holding the side edges of said section together to maintain said section in arcuate form.

3,931,827
METHOD AND APPARATUS FOR STYLING SYNTHETIC WIGS

Edward H. Coleman, 2226 Fulton Ave., Cincinnati, Ohio 45206

Filed Sept. 17, 1973, Ser. No. 397,677
Int. Cl.² A41G *3/00*
U.S. Cl. 132—56 **2 Claims**

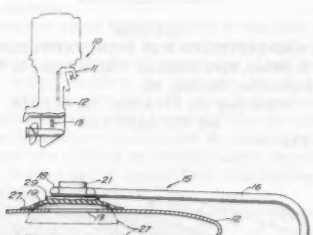


1. A method of styling synthetic wigs having synthetic fibers, the method comprising the steps of:
   steaming and stroking said wig fibers and thereby disentangling the fibers, straightening and softening said fibers and relaxing fiber memory of any prior set,
   putting the wig fibers up into the desired style,
   subjecting the put up fibers to steam to further relax fiber memory of any prior set, and
   thereafter cooling said fibers by subjecting the fibers to a temperature of approximately 32°F. for approximately 5 minutes, while the fibers are put up, in order to set them in the put up style.

3,931,828
FLUSHING ACCESSORY FOR OUTBOARD MOTORS

Roger J. Lawler, Lakewood, Calif., assignor to Quik-N-Easy Products, Inc., Monrovia, Calif.

Filed Jan. 2, 1975, Ser. No. 538,039
Int. Cl.² B08B *3/02, 9/00*
U.S. Cl. 134—167 R **6 Claims**

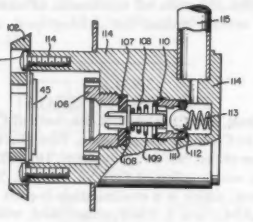


1. A self-gripping flushing accessory quickly attachable to and detachable from the cooling water intake openings of an outboard marine engine without need for tools or fasteners while flushing the engine cooling passages, said accessory having a U-shaped main body equipped between the free ends of the legs thereof with resilient sealing means facing toward one another, at least one of said resilient sealing means being provided with a water flow passage readily connectable to a source of water, said U-shaped main body being sized to straddle the engine drive shaft housing with the legs of said main body holding said resilient sealing means seated over a respective one of said cooling water inlets with a snug substantially water-tight self-gripping fit whereby the engine water circulating pump is operable to circulate cooling and flushing water through the engine cooling passages without need for submerging said engine cooling water inlets in a body of water.

3,931,829
VALVED SERVICE OUTLET

David A. McWhinnie, Jr.; Laurence G. Viero, and Donald J. Freeburg, all of Chicago, Ill., assignors to Oxequip Health Industries, Chicago, Ill.

Continuation of Ser. No. 375,302, June 29, 1973, abandoned. This application Nov. 26, 1974, Ser. No. 527,387
Int. Cl.² F16L *29/00*
U.S. Cl. 137—329.1 **5 Claims**



1. In the known type of valved service outlet for oxygen administration and the like comprising:
   a. a valve body having a longitudinal passage open at one end, closed at the other and having a transverse supply port extending outwardly from the closed end of said passage,
   b. longitudinally displaceable valve means located intermediate the ends of said longitudinal passageway, which valve means in one position is adapted to permit gas flow through said longitudinal passageway and in the other position block gas flow through said passageway,
   c. a cover plate secured to the valve body and overlying the open end of the passageway and having an opening for insertion of a connecting tube which is adapted to engage said valve means and to move it longitudinally from one position to another,
   d. guiding and locking means interiorly of the cover plate for guiding and locking a connecting tube into an inserted position, and
   e. a door interiorly of the cover plate and overlying the opening therein and swingable inwardly therefrom upon insertion of said connecting tube,

the improvement which comprises:
   said guiding and locking means comprising at least one hemispherical cam surface composed of very hard metal.

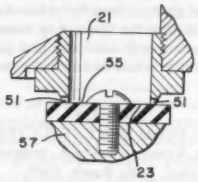
3,931,830
PUMP SYSTEMS FOR LIQUIDS

Darrell D. Gritz, Little Rock, Ark., assignor to Jacuzzi Bros. Incorporated, Little Rock, Ark.

Division of Ser. No. 327,955, Jan. 30, 1973, Pat. No. 3,814,543. This application Mar. 20, 1974, Ser. No. 452,745
Int. Cl.² F16K *31/12, 15/00;* **F04B** *49/00*
U.S. Cl. 137—505.45 **2 Claims**

1. A pressure regulating valve assembly comprising a housing having an input opening for receiving liquid under pressure, an outlet opening for discharging such liquid at a re-

duced pressure, and a valve component and associated valve seat component intermediate said inlet and outlet openings and in the flow path between them, one of said components having a notch in a surface facing the other component, and said other component including a disc of compressible mate-



rial and a solid backing for said disc to preclude flexing thereof while enabling compression of said disc upon closing of said valve component upon said seat component, said notch being of a depth such that upon closing of said valve upon said valve seat, said disc material will compress into and fill said notch to block flow therethrough.

3,931,831

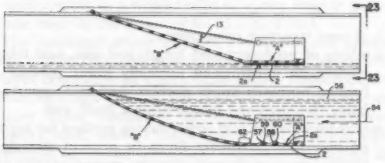
ELASTIC CHECK VALVE AND METHOD OF CONSTRUCTION

George F. French, 4009 Linden St., Oakland, Calif. 94608

Filed May 2, 1974, Ser. No. 466,288

Int. Cl.² F16K *15/14*

U.S. Cl. 137—525 **8 Claims**



1. An article of manufacture for a check valve in an enclosed curvilinear conduit comprising:

a. an elastic, flexible semi-circular elongated "foot" portion of curvilinear cross section dimensioned for non-sealing and registered sealing engagement with approximately one half the cross sectional surface of an elongated portion of said matching curvilinear conduit and having an upstream end and a downstream end;

b. said foot portion having means for attaching its upper edges to the side walls of said conduit;

c. an elastic, flexible elongated "bowsprit" portion having that shape resulting from a curvilinear tube intersecting said conduit at an angle wherein said "bowsprit" is that portion of said curvilinear tube lying below the intersection line of said curvilinear tube and said conduit;

d. said "bowsprit" portion having a width at its downstream end substantially equal to the inside diameter of said conduit and said "foot" portion and tapering to a blunt circular point at its upstream end;

e. said downstream end of said "bowsprit" portion is connected to said upstream end of said "foot" portion;

f. said "bowsprit" portion having edges which lie in a substantially flat plane corresponding to said intersection line of said curvilinear tube and said conduit;

g. said "bowsprit" portion having means adapted for attachment of said edges to the side walls of said conduit wherein said edges are adapted for attachment to said conduit along a line lying in a single flat plane which extends from a point on the top edge of said conduit to points lying on approximately the mid point of said conduit; and

h. said "foot" portion and said "bowsprit" portion are capable of flexing in a reverse curved direction upon application of external pressure and have a "memory" for automatically returning to their original curvatures upon the removal of such external pressure.

3,931,832

TIMING DEVICE FOR PNEUMATIC CONTROL SYSTEMS

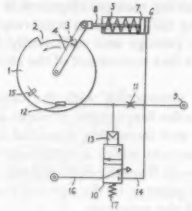
Karl Hodler, 119 Brunishalde, CH 5611 Buttikon AG, Switzerland, and Erich Walter, 124 Harksheider Weg, D 2085 Quickborn, Germany

Continuation of Ser. No. 344,064, March 23, 1973, abandoned, which is a continuation of Ser. No. 112,596, Feb. 4, 1971, abandoned, which is a continuation-in-part of Ser. No. 774,824, Nov. 12, 1968, abandoned. This application June 27, 1974, Ser. No. 483,518

Claims priority, application Germany, Dec. 8, 1967, 1650450

Int. Cl.² F15B *21/10*

U.S. Cl. 137—624.11 **6 Claims**



1. A timing device for a pneumatic control system of the type comprising a conduit (9) for the passage of successive pneumatic signals said signals being constituted by changes in pneumatic pressure in said conduit, and a valve (10) controlling the passage of said signals through said conduit, said timing device comprising,

a control element (15) movable over a predetermined path,

a control spring (26) coupled to said control element for moving said control element over said path from a first position to a second position,

a housing (6) connected to said conduit, said housing containing pressure-responsive means (7) movable in response to pneumatic pressure,

coupling means (1, 3) coupling said pressure-responsive means to said control element so that when said pressure-responsive means is supplied with energy by a signal received through said conduit, energy is stored in said control spring,

a return spring (5) against which said pressure-responsive means operates,

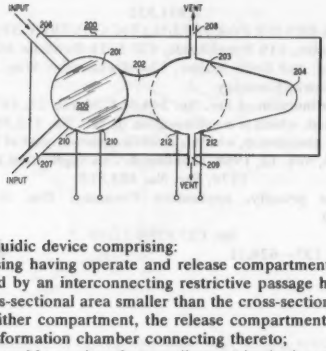
a balance wheel (25) coupled to said control element to maintain the movement of said control element at a constant speed,

means (12) connected between said valve and control element and through which said valve is actuated by said control element to permit passage of the signal, when said control element is moved from the first position to the second position, said coupling means comprising a locking member (3) for releasing or locking said control element in response to the pneumatic signal received through said conduit.

3,931,833
FLUIDIC DEVICE

Donald Lee DeGregory, Reynoldsburg, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 2, 1974, Ser. No. 511,435
Int. Cl.² F15C *3/06*
U.S. Cl. 137—829 **6 Claims**



1. A fluidic device comprising:

a housing having operate and release compartments separated by an interconnecting restrictive passage having a cross-sectional area smaller than the cross-sectional area of either compartment, the release compartment having a deformation chamber connecting thereto;

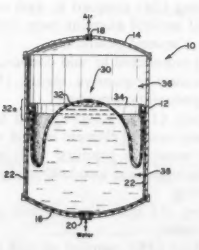
a deformable moving element disposed in the housing, the element having sufficient size with respect to the cross-section of the passage and sufficiently high surface tension to prevent free movement of the element through the passage; and

• pressure means connecting with the operate and release compartments for forcing the element into the deformation chamber and increasing potential energy of the element by an amount which is sufficient to effect the element's movement from the deformation chamber through the restrictive passage to the operate compartment upon termination of the pressure.

3,931,834
EXPANSION TANK DIAPHRAGM ASSEMBLY

Eugene Caillet, St Marys, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 26, 1974, Ser. No. 483,188
Int. Cl.² F16L *55/04*
U.S. Cl. 138—30 **10 Claims**



1. In combination with an expansion tank as used in pressurized water systems wherein one portion of the tank is occupied by water while the other portion is occupied by a gas, said tank having a liner mounted within the tank covering the walls of the tank that are in contact with the water, an assembly for separating the two portions of the tank at the wall/ liner interface into non-communicating chambers comprising:

a a substantially flexible elastomeric diaphragm mounted within the tank at the wall/liner interface, said diaphragm having at least two annular, outward projecting, wedge-shaped fins positioned around the outward facing peripheral surface thereof such that one of the fins is in contact with the tank wall at the interface while the other of said fins is in contact with the liner, and

b a continuous and substantially rigid backup ring positioned on the inward facing peripheral surface of the diaphragm and having a diameter less than the diameter of the liner but greater than the relaxed diameter of the diaphragm such that the fins are in compression and in sealing engagement with said tank and liner respectively when the assembly is inserted into the tank.

3,931,835
LONG TERM VENT STRUCTURE

Joseph C. McGuire, Kennewick, Wash., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 296,680, Oct. 11, 1972. This application Jan. 28, 1974, Ser. No. 436,900
Int. Cl.² F15D *1/02*
U.S. Cl. 138—42 **5 Claims**

1. A vent structure comprising:

a tubing of predetermined length and size, said tubing including an undeformed normally lower portion and a formed normally upper portion, and said upper portion being flattened and folded against itself; and

means provided in said upper tubing portion for separating its opposing proximate faces to prevent sintering and similar closures thereof whereby proper venting of fluid flow can be maintained through said vent structure to produce a reliable, long term operation, vent structure.

3,931,836
LAMINATED POLYMERIC ARTICLES AND PROCESS FOR THE PRODUCTION THEREOF

William Charles Thiele, Somerville, N.J., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 225,662, Feb. 11, 1972. This application Oct. 15, 1973, Ser. No. 406,750
Int. Cl.² F16L *9/16, 9/12*; B32B *31/06, 27/12*
U.S. Cl. 138—141 **21 Claims**

1. In a process for bonding together a first resinous layer containing as a major component a first polymeric resin, said first polymeric resin being selected from the group consisting of poly(vinyl acetate), poly(methyl methacrylate), polystyrene, polybutene, poly(vinyl butyral) and the polymeric olefinic chlorides, and a second resinous layer containing as a major component a second polymeric resin, said second polymeric resin being thermosetting, dissimilar to and substantially chemically unbondable directly to said first polymeric resin and selected from the group consisting of epoxy resins, polyester resins and phenolic resins; which process comprises forming a surface solution, on the surface of said first resinous layer, of said first polymeric resin and a coating comprising a butadiene resin and a mutual solvent for said first polymeric resin and said butadiene resin, where said butadiene resin is substantially curable to said second polymeric resin and substantially chemically unbondable directly to and substantially

incompatible with said first polymeric resin other than in a solvated state; at least partially fusing said surface solution; applying to said coating said second resinous layer containing said second polymeric resin in a substantially uncured form; and curing said second polymeric resin and simultaneously bonding said second resinous layer to said coating:

the improvement which comprises incorporating into said coating said second polymeric resin and a curing agent for said second polymeric resin, and during the curing step bonding said second polymeric resin in said coating to said second polymeric resin in said second resinous layer.

13. A laminated article having improved bonding between the laminae comprising a first resinous layer containing as the principal component a polymeric olefinic chloride resin selected from the group consisting of polyvinyl chloride and copolymers of vinyl chloride and vinylidene chloride, and a second resinous layer containing as the principal component an epoxy resin, said first and second polymeric resins being bonded into a laminate by a coating therebetween and in intimate contact therewith, said coating initially comprising:

a a butadiene resin, which is thermoplastic, substantially curable to said epoxy resin and substantially chemically unbondable directly to and substantially incompatible with said polymeric olefinic chloride resin other than in a solvated state:

b said epoxy polymeric resin:

c a mutual solvent for at least said polymeric olefinic chloride resin and said butadiene resin: and

d a curing agent for said epoxy resin;

said coating and said polymeric olefinic chloride resin forming a fused surface solution on the surface of said first resinous layer and said coating and said second resinous layer being chemically bonded; and

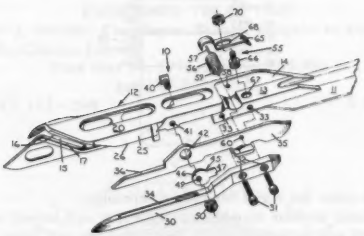
said epoxy resin and said butadiene resin being present in said coating in a weight ratio of epoxy resin to butadiene resin in the range of 0.175:1 to 0.70:1.

18. The laminated article of claim 16 wherein said laminae comprise a poly(vinyl chloride) hollow inner cylinder and an outer layer thereupon of epoxy resin matrix reinforced with glass fiber, and said coating bonding said inner cylinder and said outer layer comprises acrylonitrile-butadienestyrene resin, epoxy resin, methyl ethyl ketone, and a curing agent comprising an equimolar complex of diacetoneacrylamide and diethylenetriamine.

3,931,837
CARRIER FOR SHUTTLELESS LOOM

Richard L. Volpe, Hopedale, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 5, 1975, Ser. No. 555,548
Int. Cl.² D03D 47/22
U.S. Cl. 139—122 N **11 Claims**



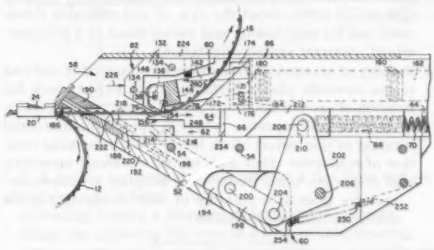
1. An improved carrier for inserting weft yarn into the shed formed between warp yarns on a loom of the type in which the weft yarn is supplied from a source located outside of the warp and is inserted into the shed by a carrier which is attached to a reciprocating inserter, said improved carrier, comprising:

1. a main body portion which includes:
   a. a shank portion for attachment to the reciprocating inserter,
   b. a back wall extending outwardly from said shank portion, said back wall including means defining a yarn guide,
   c. a top wall extending forwardly from said back wall,
   d. a front wall extending downwardly from said top wall a distance less than the height of said back wall, and
   e. a yarn gripping surface on the bottom surface of said front wall,
2. a yarn guide finger secured at one end to said shank portion and extending outwardly therefrom in the same direction as said front wall and located in underlying relationship with respect to said gripping surface thereon;
3. a gripper finger having a gripping surface for cooperation with said yarn gripping surface on said front wall,
4. means mounting said gripper finger on said front wall for rotation about a pivot axis wherein said means provides for variation in the spatial location of the pivot axis, and
5. a biasing means for urging said gripper finger into gripping contact with said yarn gripping surface.

3,931,838
BUNDLE STRAPPING TOOL

Johannes Cornelis Wilhelmus Bakermans, Etters, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 25, 1974, Ser. No. 526,550
Int. Cl.² B21F 9/02
U.S. Cl. 140—123.6 **18 Claims**



1. A tool adapted to receive the free end of a self-locking bundle tie which has a loop disposed about a bundle, to tighten said loop by applying tension to the free end of the bundle tie, to discontinue tightening said loop when the desired tension is achieved within the loop by relaxing the tension applied to the free end of the bundle tie, and to cut the free end of the bundle tie after the tension has been relaxed; said tool comprising;

plate means;

tensioning means including

a bell crank lever mechanism having pawl means mounted on one end, said free end of the bundle tie extending between said pawl means and said plate means,

mounting means for mounting the bell crank lever mechanism for reciprocal movement and also for swinging shifting movement between a first tension applying position and a second position, and

reciprocal means interconnected with the mounting means and operable to reciprocate the mounting means and the bell crank lever mechanism, said tensioning means being operable when the bell crank lever mechanism is in its first position to exert tension on the free end of the bundle tie during reciprocation of the bell crank lever mechanism in one direction to tighten said loop disposed about said bundle, and, when the bell crank lever mechanism is in its second position being unable to tighten said loop about said bundle during reciprocation of the bell crank lever mechanism in said one direction; and

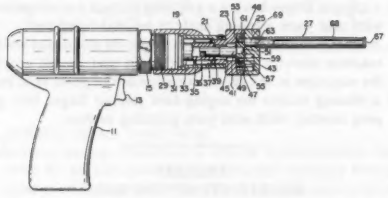
cutting means operable to cut the free end of the bundle tie during reciprocation of the bell crank lever mechanism in said one direction only after said bell crank lever mechanism has shifted to the second position.

3,931,839

MULTIPLE BIT WIRE WRAP TOOL

Per Aron Burman, Temple City, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 4, 1975, Ser. No. 555,237
Int. Cl.² B21F *3/00*; B65H *81/06*
U.S. Cl. 140—124 **19 Claims**



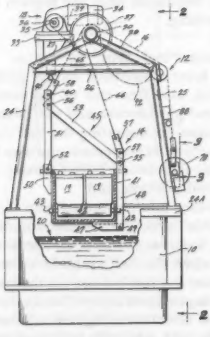
1. In a multiple bit wire wrap tool:
an axially rotatable driveshaft;
a swivel block having opposite planar surfaces;
an eccentric means connecting said driveshaft to one planar surface of said swivel block for circumferentially rotating said swivel block about the axis of said rotatable driveshaft and for maintaining said swivel block in a predetermined, constant spatial orientation;
a plurality of eccentric members each connected at one end to the opposite planar surface of said swivel block for rotation of each of said one ends about the respective axis of each of said eccentric members upon circumferential rotation of said swivel block thereby effecting axial rotation of respective other ends of said eccentric members;
said respective other ends being adapted to receive respective ones of a plurality of wire wrapping bits for eccentric rotation therewith.

3,931,840

ACID FILLING APPARATUS FOR STORAGE BATTERIES

Helmut Kurt Rinnert, Yorba Linda, Calif., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Nov. 14, 1974, Ser. No. 523,692
Int. Cl.² B65B *3/04*
U.S. Cl. 141—1 **18 Claims**



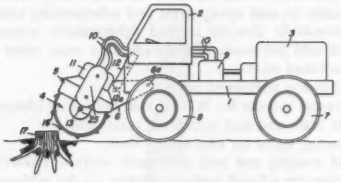
17. A method of simultaneously filling a plurality of storage batteries having filling ports with acid, comprising:
positioning said batteries over an open topped tank of acid with said filling ports facing upwardly;
inclining said batteries at a predetermined angle of inclination to determine the level of acid which remains in the batteries after filling;
immersing batteries into said tank for a preselected amount of time to fill said batteries with acid;
raising said batteries out of said tank while maintaining said batteries in an inclined position.

3,931,841

METHOD OF COMMINUTING TREE STUMPS

Hans Blum, Siegfriedstrasse 14, 6841 Bobstadt, Germany

Division of Ser. No. 313,067, Dec. 7, 1972, Pat. No. 3,868,980.
This application Aug. 9, 1974, Ser. No. 496,440
Claims priority, application Germany, Mar. 21, 1972, 2213667
Int. Cl.² B27M *1/00*; A01G *23/08*; B27C *9/01*; B27G *13/04*
U.S. Cl. 144—309 R **14 Claims**



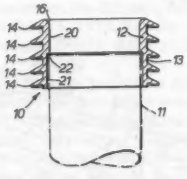
1. A method of comminuting a tree stump employing a heavy cylindical cutting roller having a plurality of spaced cutting knives projecting throughout its peripheral surface; the steps comprising, rotating the roller at high speed and moving it forwardly against the side of the stump with the knives moving from an upper portion of the stump to a lower portion of the stump to cut chips from the stump generally along the grain of the stump.

3,931,842

GOLF TUBE COLLAR

David John White, 8 Birches Close, Crowborough Sussex, England

Filed June 18, 1974, Ser. No. 480,321
Claims priority, application United Kingdom, June 20, 1973, 29281/73
Int. Cl.² A63B *55/00*
U.S. Cl. 150—1.5 R **3 Claims**



1. A collar for a golf bag tube comprising:
a plastic annular member having a first and second open end and including axially directed inner and outer surfaces;
said outer surface including a plurality of axially spaced projections thereon, said projections comprising circumferential flanges which slope away from said first open end of said plastic member; and,
said inner surface including a first part and a second part of lesser diameter, the first and second part including a

radially extending step therebetween for engaging the end of said golf bag tube.

3,931,843

PNEUMATIC TIRES

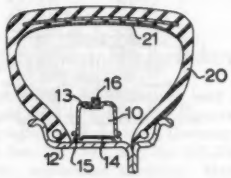
Reginald Harold Edwards; Geoffrey Lionel Coulter, both of Sutton Coldfield, and Alan Michael Dodd, Walsall, all of England, assignors to Dunlop Limited, London, England

Continuation of Ser. No. 353,938, April 24, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 536,972

Claims priority, application United Kingdom, May 3, 1972, 20502/72

Int. Cl.² B60C *17/00, 17/04*

U.S. Cl. 152—330 L **15 Claims**



1. A pneumatic tire and rim assembly capable of being run in a deflated condition comprising:

a. a pneumatic tire having an interior surface and mounted upon a rim to define an inflation chamber, said assembly having means to prevent the tire beads from becoming dislodged from the rim when operated in a deflated condition;

b. means at least for lubricating contacting interior surfaces of the tire when operated in a deflated condition comprising a composition having a plurality of ingredients at least one of said ingredients being a lubricating material;

c. said composition being carried in the assembly in at least two parts, said parts containing different ingredients or combination of ingredients;

d. enclosing means for enclosing at least one of said parts of the composition separately from the other;

e. the other part being carried on the interior surface of the assembly;

f. said enclosing means being adapted to release its part of the composition into said inflation chamber upon deflation or substantial loss of inflation pressure to permit the parts of the composition to mix to bring all the ingredients of the composition together.

3,931,844

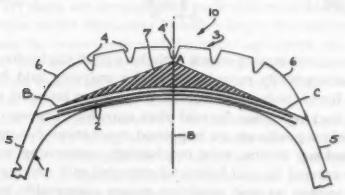
CUSHIONED TREAD TIRE

Henri J. Mirtain, Compiegne, France, assignor to Uniroyal, S.A., Clairox, France

Filed May 14, 1973, Ser. No. 359,936

Int. Cl.² B60C *9/18*

U.S. Cl. 152—360 **8 Claims**



1. A pneumatic vehicle tire comprising:

a radial ply carcass;

first and second sidewalls overlying the lateral portions of said carcass;

a tread constituted by a rubber compound overlying the crown region of said carcass;

a breaker interposed between said tread and said crown region of said carcass in circumferentially surrounding relation to the latter; and

a cushion constituted by a rubber compoung interposed between said breaker and said tread and extending symmetrically about the median equatorial plane of the tire,

the radial thickness of said cushion being a maximum in the area of the median equatorial plane of the tire and tapering to a minimum in the shoulder region of said tread,

the rubber of said cushion being softer than the rubber of said tread material, thereby providing a more pliable support in the central portion of the tread than in the shoulder region thereof.

3,931,845

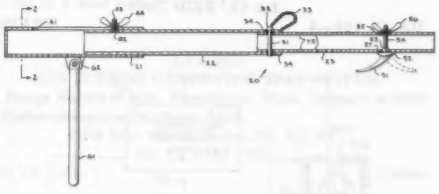
TIRE CHANGING DEVICE

Tracy W. Dixon, 3007 Topham Circle, Houston, Tex. 77018

Filed Aug. 12, 1974, Ser. No. 496,572

Int. Cl.² B60C *25/04*

U.S. Cl. 157—1.22 **1 Claim**



1. A device for removing and affixing a tire from and on a wheel rim, comprising:

A housing having a plurality of telescoping sections;

means for adjusting the overall length of said housing;

means connected to one of said sections for pivotally supporting said housing within said wheel; and

Combination mounting and demounting means movably linked to one of said sections, said combination means comprising;

a. tool having a tang portion adapted to be inserted intermediate said tire and rim,

b. means for permitting said tang to assume a plurality of positions relative to said linked section, such means comprising a male portion of said tool having a polygonal cross-section and an aperture in said linked section of a configuration correlative to said cross-section, and

c. means for releasably fixing said tank in any selective one of said positions.

3,931,846

BRAKES FOR CORDS

Edwin Zilver, Doorwerth, Netherlands, assignor to Silverflex Internationaal N.V.

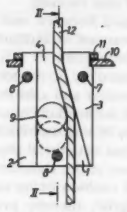
Filed Apr. 26, 1974, Ser. No. 464,303

Int. Cl.² E06B *3/92*

U.S. Cl. 160—178 **2 Claims**

1. A brake for a cord comprising a movable clamping body surface and a relatively fixed braking surface between which surfaces the cord is fed and selectively clamped, characterized in that the braking surface is the inner wall of an open ended housing of frusto-conical shape and the clamping body is a sphere that is loosely mounted within the housing and is of a diameter which is smaller than the widest part of the housing

and greater than the narrowest part of said housing reduced by the thickness of the cord, and a stop member mounted in



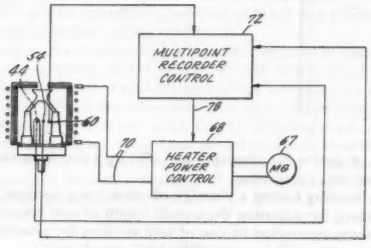
the widest part of said housing to prevent the sphere from leaving the housing.

3,931,847

METHOD AND APPARATUS FOR PRODUCTION OF DIRECTIONALLY SOLIDIFIED COMPONENTS

Bruce E. Terkelsen, Cheshire, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sept. 23, 1974, Ser. No. 508,303
Int. Cl.² B22D *25/06*
U.S. Cl. 164—4 **20 Claims**



1. In the manufacture of columnar grained articles the steps of

providing a ceramic mold in which the article is to be cast, said mold including a mold cavity other than the article cavity to receive a thermocouple,

positioning the mold on a chill plate with the mold in a furnace,

positioning another thermocouple externally of the mold and adjacent to the thermocouple cavity of the mold,

placing a second thermocouple in said therocouple cavity,

providing a third thermocouple in said furnace for controlling the furnace temperature,

heating the furnace for heating the mold therein with the third thermocouple limiting the maximum temperature to a selected temperature,

continuing heating of the mold until the second thermocouple indicates that the interior of the mold has reached the desired temperature for pouring,

pouring the alloy in the mold,

withdrawing the mold slowly in a controlled manner from the furnace to cause an upward movement of a thermal gradient along the mold for solidifying the alloy,

maintaining the heat within the furnace under control of the third thermocouple, and

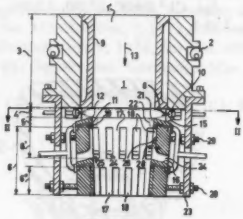
rapidly completing the mold withdrawal when the first thermocouple indicates a temperature below the melting point of the alloy.

3,931,848

METHOD AND APPARATUS FOR COOLING A STRAND CAST IN AN OSCILLATING MOLD DURING CONTINUOUS CASTING OF METALS, ESPECIALLY STEEL

Markus Schmid, Zurich, Switzerland, assignor to Concast AG, Zurich, Switzerland

Filed May 28, 1974, Ser. No. 474,009
Claims priority, application Switzerland, June 4, 1973, 8009/73
Int. Cl.² B22D *11/04, 11/124*
U.S. Cl. 164—83 **17 Claims**



1. A method of cooling a strand in an oscillating continuous casting mold during the continuous casting of metals, especially steel, comprising the steps of:

a. forming a cast strand in the continuous casting mold and which strand travels through the mold;

b. indirectly cooling the cast strand as well as guiding the cast strand at all sides in a first zone during passage of the strand through the mold;

c. after the indirect cooling of the strand of step (b) spraying water onto the cast strand to directly cool the cast strand in an intermediate zone which is open at all sides; and

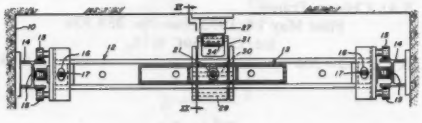
d. in a last cooling zone guiding the strand by means of substantially strip-shaped support surfaces extending essentially in the direction of travel of the strand and between these support surfaces directly cooling the strand by water guided in substantially strip-shaped water channels in a substantially strip-shaped configuration along the strand.

3,931,849

MECHANISM FOR OPERATING THE LOCKING MEANS FOR THE CHILL PLATE OF A RIGID STARTER BAR

Thomas A. Morris, Jefferson Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 20, 1974, Ser. No. 498,910
Int. Cl.² B22D *11/08*
U.S. Cl. 164—274 **4 Claims**



1. In a combination which includes a rigid starter bar, a chill plate, a vertically movable hoist for carrying said bar, and means for receiving said hoist and bar when lowered, said bar having locking means for said plate movable between released and locked positions, an improved mechanism for operating said locking means, said mechanism comprising actuating means carried by said hoist and engaging said locking means, a first means on said receiving means cooperable with said actuating means for moving said locking means to its locked position when said bar and hoist ascend from their lowermost

position, and a second means on said receiving means spaced above the first-named means thereon cooperable with said actuating means for moving said locking means to its released position when said hoist and said bar descend to disconnect said bar from said plate, said actuating means clearing the second-named means on said receiving means during ascent of said hoist without changing the position of said locking means.

3,931,850

APPARATUS FOR FEEDING AND DISTRIBUTING STEEL MELTS

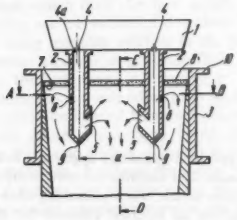
Helmut Landgraf, Rumeln-Kaldenhausen, and Herbert Forster, Dusseldorf, both of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Jan. 23, 1975, Ser. No. 543,294

Claims priority, application Germany, Mar. 11, 1974, 2412053

Int. Cl.[2] B22D *11/10*

U.S. Cl. 164—281 10 Claims



1. Apparatus for feeding and distributing a steel melt in a continuous casting mould for slabs, comprising a pouring vessel with outlet apertures arranged in its bottom portion and with immersion outlet elements which are arranged below the said apertures and include lateral outflow apertures, characterized in that below the outlet apertures (4) of the pouring vessel (1) there are arranged for each slab mould (3) a pair of immersion outlet elements (2) with a larger internal cross-section than the cross-section of the outlet apertures, the bottom ends of the said outlet elements being closed, each of said immersion outlet elements (2) having a pair of outflow apertures (5, 6) of different cross-sectional size, both situated below the bath surface level (7) in the mould (3), said outflow apertures (5, 6) being located opposite one another in the walls of the immersion outlet elements (2) but are offset relatively to one another in the vertical sense, and the outflow apertures (5) having the larger cross-section form the lower outflow apertures and are directed towards the center of the mould.

3,931,851

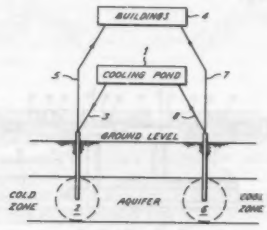
LIQUID AQUIFER ENERGY STORAGE METHOD

William B. Harris, and Richard R. Davison, both of Bryan, Tex., assignors to William D. Morse, Jr., Houston, Tex., a part interest

Filed Feb. 1, 1974, Ser. No. 438,685

Int. Cl.[2] F24D *11/00*

U.S. Cl. 165—2 14 Claims



5. The method of claim 2 wherein the water in step (a) is heated by a solar heater.

3,931,852

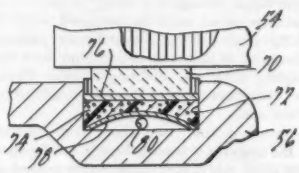
GAS TURBINE GENERATOR SEAL SYSTEM

V. Durga Nageswar Rao, Woodhaven, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 12, 1973, Ser. No. 415,057

Int. Cl. F28d *19/00*

U.S. Cl. 165—9 6 Claims



1. A monolithic rubbing seal assembly for sealing a rotary regenerator in a gas turbine engine environment, said seal assembly having at least one generally semicircular, monolithic seal element, a crossarm seal element joining the ends of said semicircular seal element thereby defining a gas flow region, a housing base for said seal assembly with a general semicircular cavity and a cavity conforming generally in shape to the shape of said crossarm seal element, said cavities receiving said seal elements whereby said seal elements, together with said base, define an integral assembly, said seal elements being formed of ceramic material and each having a surface adapted to sealingy engage the adjacent surface of said regenerator, clearance between the transverse sides of said seal and the adjacent wall of said cavities and a heat resistant resilient material located between the seal elements and the base of the respective seal cavities, said resilient material engaging the transverse sides of said cavities and defining with said cavities a cooling air flow chamber in communication with a high pressure, low temperature gas region for accommodating air flow in the direction of the principal axis of said seal whereby said resilient material is cooled as said seal elements are urged pneumatically into sealing engagement with respect to said regenerator core.

3,931,853

DEVICE FOR THE SUPPLY AND DISCHARGE OF COOLING LIQUID IN THE WORMS OF AN EXTRUDER PRESS

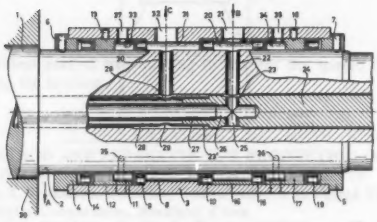
Warner Jan de Putter, Hardenberg, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed Oct. 16, 1973, Ser. No. 406,924

Claims priority, application Netherlands, Oct. 17, 1972, 7214008

Int. Cl.[2] F28F 5/06

U.S. Cl. 165—87 8 Claims



1. An assembly to circulating a cooling liquid in the shaft of an extruder press, comprising, in combination:

a shaft having an axial bore portion, radially extending, axially-spaced inlet and outlet passages communicating with the bore portion and the outer surface of the shaft;

conduit means in said bore portion, said conduit means comprising individual conduit portions respectively communicating with the inlet and outlet passage for conducting the liquid through the shaft;

three axially-spaced seals circumposed about the shaft in flanking relation to the inlet and outlet passages, an intermediate one of said seals cooperating with the respective remaining seals and defining annular liquid inlet and outlet chambers about said shaft, separated by said intermediate seal;

spacer means circumposed about said shaft and engaged with the seals for retaining them in axially-spaced relation on the shaft, said spacer means being spaced radially from the outer surface of said shaft and said seals having portions projecting radially inwardly beyond said spacer means and into engagement with the outer surface of the shaft;

a tubular sleeve circumposed about the outer periphery of said seals and spacer means and including openings communicating with the respective inlet and outlet chambers;

centering rings circumposed about said shaft, abutting the outermost of said seals for retaining the seals in a relative fixed relation;

means retaining the sleeve in fixed relation to said centering rings;

retention collar means circumposed about said shaft at opposite ends of the sleeve; and

means retaining the collar means in fixed relation on the shaft, said retention collar means comprising a ring member including an axial annulus projecting into the sleeve ends for orienting the sleeve on the shaft, said means retaining the collars comprising fasteners adjustably retaining the assembly on the shaft, annular lubricating chambers outwardly of the outermost annular seals and within said centering rings, and further annular seals circumposed about said shaft between said centering rings and retention collar means outwardly of said lubricating chambers.

3,931,854

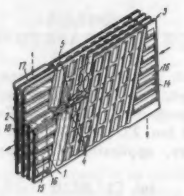
PLATE-TYPE HEAT-EXCHANGE APPARATUS

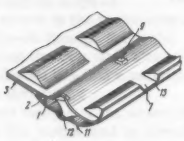
Viktor Vasilievich Ivakhnenko, ulitsa Sedova 14, kv. 8; Evgeny Fedorovich Kuznetsov, ulitsa Krasnoputilovskaya 71, kv. 27; Anatoly Vladimirovich Sudarev, Georgievskaya ulitsa 2, kv. 57, all of Leningrad, U.S.S.R.; Jury Grigorievich Akodes, deceased, late of Leningrad, U.S.S.R., and by Zoya Ivanovna Akodes, administrator, Piskarevsky prospekt 15, kv. 67, Leningrad, U.S.S.R.

Filed Aug. 24, 1973, Ser. No. 391,276

Int. Cl.[2] F28F 3/00

U.S. Cl. 165—166 3 Claims



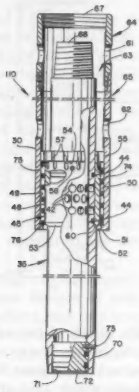


1. A plate-type heat-exchange apparatus in which two heat exchanging media flow counter-current, comprising a stack of rectangular plates which, when joined together in pairs, define an element having an internal channel for the flow of one heat-exchanging media and when a second similar element is joined together with the first element, the first and second elements coact to provide a channel therebetween for the other heat-exchanging media, each plate having end parts and a middle part therebetween, the middle part having alternate crests and troughs extending transversely thereof, every other crest of one plate having a plurality of plane surfaces at spaced intervals along said crest providing passageways across said crest leading to the troughs on each side of said crest, the crest on each side of said troughs having a row of spaced outwardly extending projections, every other trough of the other plate having a row of spaced outwardly extending projections, so that when said plates are stacked together to define the element, the plane surfaces of one plate adjoin the crests of the other plate to provide the internal channel with a corrugated shape in longitudinal section and a substantially slotted shape in cross-section, and upon said second similar element being positioned on the first element, the projections of said one plate of the first element adjoin the projections of said other plate to provide the channel therebetween of corrugated shape in longitudinal section and substantially slotted shape in cross-section, a distributing zone at each end part for the heat exchanging media, means providing communication between one distributing zone and one of the channels, and further means providing communication between the other distributing zone and the other channel.

3,931,855
DOWNHOLE PACKER ACTUATED VENT ASSEMBLY

Roy R. Vann, Artesia, N. Mex., and Flint R. George, Artesia, N. Mex., assignors to Vann Tool Company, Inc., Artesia, N. Mex.

Continuation-in-part of Ser. No. 382,958, July 26, 1973, Pat. No. 3,871,448. This application Oct. 23, 1974, Ser. No. 517,390
Int. Cl.² E21B *33/12*
U.S. Cl. 166—128 7 Claims



1. In a packer actuated vent assembly having a packer device which includes a body, a packer element, a hollow mandrel through which fluid can flow axially, and means by which the device can be anchored downhole in a well bore; said mandrel being movable relative to the packer body for setting the packer element to preclude fluid flow across the packer device; the improvement comprising:

a barrel attached to and extending from said body, a hollow mandrel extension spaced from and received within said barrel, said mandrel extension being attached to and extending from said hollow mandrel in series flow relationship therewith, a lateral flow port formed in said mandrel extension; an annular valve means slidably received about said mandrel extension and movable axially from a flow preventing to a flow permitting position for causing a fluid flow path to be formed through said port when said valve means is moved from a flow preventing to a flow permitting position;

a shoulder formed on said annular valve means, a shoulder formed on said barrel in underlying relationship respective to the first recited shoulder; and,

biasing means for moving said valve means from said flow preventing to said flow permitting position in response to relative movement between said barrel and mandrel extension.

3,931,856
METHOD OF HEATING A SUBTERRANEAN FORMATION

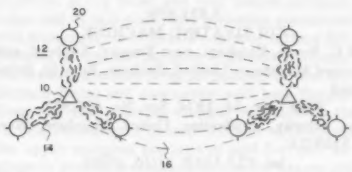
Allen L. Barnes, Allen, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 23, 1974, Ser. No. 535,162
Int. Cl.² E21B *43/20*, *43/24*
U.S. Cl. 166—245 4 Claims

1. In a method of recovering an in situ fluid from a subterranean formation containing viscous oil via heating with electrical conduction between a plurality of electrode wells completed therein, in order to improve the conductivity between said electrode wells, the improvement comprises:

drilling and completing a satellite well in said formation and adjacent an electrode well,

injecting water containing dissolved electrolyte into said formation via an electrode well having an adjacent satellite well,



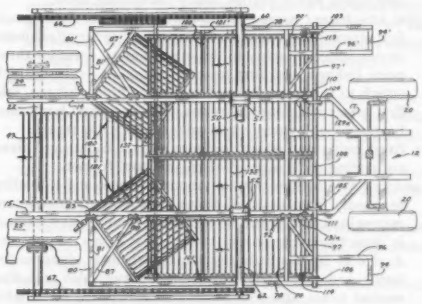
establishing fluid communication between said electrode well and said satellite well by repeated steps of heating and producing mobilized in situ fluid situated therebetween, and

circulating said water containing dissolved electrolyte between said electrode well and adjacent satellite well.

3,931,857
DEMOUNTABLE MULTI-ROW POTATO COMBINE

Edward C. O'Hare, Cambridge, and Wallace J. DeVries, Sr., Braham, both of Minn., assignors to Dahlman, Inc., Braham, Minn.

Filed Dec. 9, 1974, Ser. No. 530,953
Int. Cl.² A01D *17/00*
U.S. Cl. 171—14 8 Claims



1. a demountable multi-row potato combine, having in combination

a potato combine frame structure including power means and elevating and related conveyor supersturcture,

an outboard frame structure removably secured to each side of said frame structure,

a pivot support member removably carried by said frame structure,

yielding suspension means carried by said frame and outboard frame structures forwardly thereof,

a digger apron member mounted onto said pivot support member, said digger apron member having at least three endless conveyors thereon,

means connecting the forward portion of said digger apron member to said yielding means,

a drive shaft,

means operatively connecting said drive shaft and said digger apron member,

a pair of angularly disposed endless conveyors in converging relation with each other underlying and extending partially beyond the rearward side portions of said digger apron member,

means removably mounting said angularly disposed conveyors in operating position in connection with said frame and outboard structures, and

means driving said drive shaft and said angularly disposed conveyors.

3,931,858
CULTIVATING MACHINE

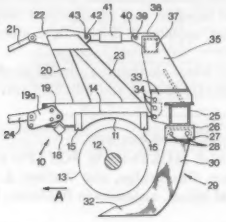
Bernard C. North, Earsham, near Bungay, England, assignor to Howard Machinery Limited, Saxham, Bury St. Edmunds, England

Filed Mar. 14, 1974, Ser. No. 450,977

Claims priority, application United Kingdom, Mar. 20, 1973, 13209/73

Int. Cl.² A01B *33/16, 49/02*

U.S. Cl. 172—63 **8 Claims**



1. A cultivating machine comprising, in combination:

a rotary cultivator including a rotor frame and a rotor on said frame which carries rotary cultivating tools;

first attachment means surmounting the rotor frame, said first attachment means including a first upper attachment device which attaches to the upper link of a tractor three point linkage, and first lower attachment devices which attach to the lower links of said three point linkage, said first lower attachment devices including fixed horizontal beams which extend rearwardly of the rotor frame;

a fixed cultivator which includes a tool frame and fixed cultivating tools supported on said tool frame;

and second attachment means mounted upon and extending forwardly from the tool frame, said second attachment means including a second upper attachment device which is detachably connected to said first upper attachment device in substantially the same horizontal plane as the latter, and said second attachment means also including second lower attachment devices which are detachably connected to the rear extremities of said horizontal beams in substantially the same horizontal plane as said first lower attachment devices;

said second lower attachment means including means by which they may be attached to the rear extremities of the beams at a plurality of selected heights relative to said beams.

3,931,859
CONVERTIBLE AGRICULTURAL IMPLEMENTS AND MACHINES

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

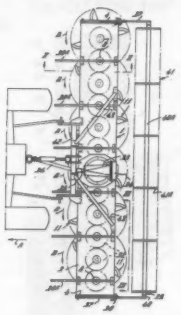
Filed Mar. 13, 1974, Ser. No. 450,670

Claims priority, application Netherlands, Mar. 14, 1973, 7303531

Int. Cl.² A01B *63/00;* **A01D** *49/00*

U.S. Cl. 172—247 **23 Claims**

1. A convertible agricultural implement comprising a frame movable over the ground and a plurality of substantially horizontal tool supports being positioned side-by-side in a row that extends transverse to the normal direction of travel, each of said supports being rotatable about a corresponding upwardly extending shaft and driving means connected to the shafts to rotate adjacent shafts in opposite directions, the opposite ends of each of said supports having sleeve-like holders that are releasably connectable to downwardly extending soil-working tools, horizontally extending cutting blades being secured to the holders of alternate ones of said supports to convert the implement from a soil-working implement with all supports having tools that work overlapping strips of soil to a cutting implement, at least one of said alternate supports having at least two sets of cutting blades that are vertically spaced apart



from another so that the blades of one set project at different horizontal levels than the blades of a second set, the length of said cutting blades exceeding at least half the distance between those shafts about which said alternate supports are rotatable and the outer tips of said blades tracing circles that substantially overlap the circles traced by the outer tips of those blades on neighboring alternate supports, the blades on neighboring alternate supports being positioned to intersect and cooperate with one another during cutting operation.

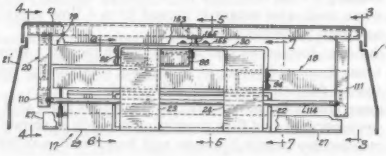
3,931,860
LOW-PROFILE PLATFORM SCALE

Chester S. Czyryk, Silver Lake, Wis., assignor to Mangood Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 511,426, Oct. 2, 1974, Pat. No. 3,894,595. This application Apr. 7, 1975, Ser. No. 565,681

Int. Cl.² G01G *21/08*

U.S. Cl. 177—257 **8 Claims**



1. A platform scale comprising

a horizontal base including in a unitary construction:

a horizontal shallow rectangular tubing at the central portion of the scale, said shallow tubing having its longitudinal axis transverse to the longitudinal axis of said scale and of said base with the ends of said shallow tubing being at the front and rear portions of the base;

a front spaced pair of vertical mounting members having for each a first vertical flange abutting and secured to the front end of said shallow tubing and a second flange normal to said first flange and having its bottom end abutting and secured to the front end portion of the top wall of said shallow tubing, said first and second flanges having their top ends at a horizontal plane;

a rear spaced pair of vertical mounting members having for each a first vertical flange abutting and secured to the rear end of said shallow tubing and a second flange normal to said first flange and having its bottom end abutting and secured to the rear end of portion of the top wall of said shallow tubing, said first and second flanges having their top ends at a horizontal plane and said second flanges of said second pair of said vertical mounting members being at the transverse vertical planes of the scale at which are located said second flanges of said first pair of said vertical mounting members;

a horizontal load cell mounting member secured to the central portion of one side wall of said shallow tubing and extending toward one end of said scale;

a front short inverted channel member fixedly mounted on the top ends of said flanges of said front pair of vertical mounting members having a short vertical flange with at least its bottom portion at an upper elevation having a flat vertical outer surface facing one end of said base at a vertical plane normal to the longitudinal axis of said base and a long flange with its bottom portion at a lower elevation having a vertical flat outer surface facing the other end of said base at a vertical plane normal to the longitudinal axis of said base; and

a rear short inverted channel member fixedly mounted on top ends of said flanges of said rear pair of vertical mounting members, said rear inverted channel member having a short vertical flange with at least its bottom portion at an upper elevation having a flat vertical outer surface facing said one end of said base at a vertical plane normal to the longitudinal axis of said base and a long flange with its bottom portion at a lower elevation having a vertical flat outer surface facing the other end of said base at a vertical plane normal to the longitudinal axis of said base and said vertical flat outer surfaces of said short and long flanges of said rear channel member being coplanar with and at the same elevations of said vertical flat surfaces of said short and rear flanges of said front channel member, respectively;

a primary U-shaped lever having in a unitary construction:

a horizontal mounting rectangular tube having at its end portions only the bottom wall and the bottom portion of the side walls of the tube;

a pair of rectangular tubes, as lever arms, spaced from each other and extending horizontally from the same one side wall of said mounting tube adjacent its end portions; and

an intermediate rectangular tube extending horizontally from said mounting tube in a direction that is normal to the longitudinal axis of said mounting tube and from the other side wall of said mounting tube, said end portions of said mounting tube of said primary lever extending axially beyond said pair of lever tubes and having coplanar vertical flat surface portions on their side walls facing in the general direction that said lever tubes extend;

a secondary U-shaped lever having in a unitary construction:

a horizontal mounting rectangular tube having at its end portions only the bottom wall and the bottom portion of the side walls of the tube;

a pair of rectangular tubes, as lever arms, spaced from each other and extending horizontally from the same one side wall of said mounting tube adjacent its end portions; and

a short member normal to the longitudinal axis of said mounting tube extending horizontally from an intermediate portion of its other side wall; said end portions of said mounting tube of said secondary lever extending axially beyond said pair of lever tubes and having coplanar vertical flat surface portions on their side walls facing in the general direction that said lever tubes extend;

means, including a first pair of flexure plates, pivotally mounting said primary lever on said long flanges of said front and rear inverted channel members of said base with said pair of lever tubes of said primary lever to positions above front and rear corner portions of said other end of said scale, said mounting means connecting said primary lever at its said coplanar vertical flat surface portions of said end portions of its said mounting tube to the lower horizontal marginal portions of said first pair of flexture plates and connecting said long flanges of said front and rear inverted channel members at their said vertical flat surfaces to said first pair of flexure plates at the upper marginal portions of said first pair of flexure plates to provide a common horizontal flexure axis transverse to the longitudinal axis of said scale and to provide the end portions of said mounting tube of said primary lever vertically spaced from said long flanges of said front and rear inverted channel members;

means, including a second pair of flexure plates, pivotally mounting said secondary lever on said short flanges of said front and rear inverted channel members of said base with said pair of lever tubes of said secondary lever to positions above front and rear corner portions of said one end of said scale, said mounting means connecting said secondary lever at its said coplanar vertical flat surface portions of said end portions of its said mounting tube to the lower horizontal marginal portions of said second pair of flexure plates and connecting said short flanges of said front and rear inverted channel members at their said vertical flat surfaces to said second pair of flexure plates at the upper marginal portions of said second pair of flexure plates to provide a common horizontal flexure axis transverse to the longitudinal axis of said scale and to provide the end portions of said mounting tube of said secondary lever vertically spaced from said short flanges of said front and rear inverted channel members;

a platform including in a unitary construction:

a horizontal rectangular ring having front and rear portions, a first end portion at said one end of said scale, and a second end portion at said other end of said scale, said ring having front and rear corner portions;

a first pair of downwardly extending vertical legs connected to said tubular ring at its front and rear corner portions at said one end of said scale;

a second pair of downwardly extending vertical legs connected to said tubular ring at its front and rear corner portions at said other end of said scale;

a front horizontal rod connecting the bottom end portions of said front legs of said pairs of legs;

a rear horizontal rod connecting said rear legs of said pairs of legs;

a first horizontal member connected at its ends to said front and rear legs of said pairs of legs at said one end of said scale, said connecting member being at an upper elevation below said pair of lever tubes of said secondary lever; and

a second horizontal member connected at its ends to said front and rear legs of said pairs of legs at said other end of said scale, said connecting member being at a lower elevation below said pair of lever tubes of said primary lever;

means connected to the distal end portions of said lever tubes of said primary lever to intermediate portions of said second horizontal member of said platform to provide a part of support of said platform by said lever arms;

means connected to the distal end portions of said lever tubes of said secondary lever to intermediate portions of said first horizontal member of said platform to provide a part of support of said platform by said lever arms;

means connected to said short member extending horizontally from said intermediate portion of said side wall of said mounting member of said secondary lever and to said

intermediate tube of said primary lever at a location spaced from distal end portion of said intermediate tube and spaced from said mounting tube of said primary lever, said short member of said secondary lever and said intermediate tube of said primary lever being located on said lever so that said short member is directly above said intermediate tube;

load cell means mounted on said load cell mounting member of said base below the distal end portion of said intermediate tube of said primary lever; and

means connected to said distal end portion of said intermediate tube and to said load cell means to provide a stress in said load cell means when said intermediate tube is raised.

3,931,861

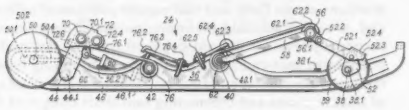
SNOWMOBILE SUSPENSION SYSTEM

Gary A. Olson, Brillion, Wis., assignor to Arctic Enterprises, Inc., Thief River Falls, Minn.

Filed May 28, 1974, Ser. No. 473,880

Int. Cl.² B62D *55/10*

U.S. Cl. 180—5 R **7 Claims**



1. In a snowmobile having a body, a tread, a tread supporting frame suspended beneath the body, and a suspension system for interconnecting said frame to said body for providing significant freedom of relative movement therebetween, said suspension system including laterally spaced first and second suspension means, an improved first suspension means comprising in combination, a rigid arm having first and second ends, said first end being pivotally interconnected to said frame at a first pivot position, a rigid lever having one end and another end, said one end being pivotally interconnected to said body at a second pivot position, said second pivot position being spaced above and laterally of said first pivot position, said second end of said arm being pivotally interconnected to said another end of said lever at a third pivot position moveable relative to both said first and second pivot positions, said first and second pivot positions being moveable between a first vertically spaced apart position and a second vertically spaced apart position less than said first vertically spaced position, said third pivot position being spaced substantially horizontally from said second pivot position at said first vertically spaced position, and being substantially vertically spaced below said second pivot position at said second vertically spaced position, and means for normally biasing said arm and said lever into said first vertically spaced position, whereby the snowmobile body traverses a greater distance with respect to said frame than the distance traversed by said second end of said arm when said frame is forced upwardly toward said body.

3,931,862

SKI SUSPENSION FOR FRONT OF SNOWMOBILE

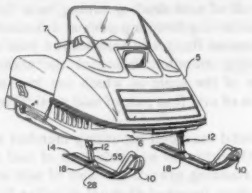
Yvon Cote, Valcourt, Canada, assignor to Bombarider Limited, Valcourt, Canada

Filed Dec. 5, 1974, Ser. No. 529,832

Int. Cl.² B62B *17/04*

U.S. Cl. 180—5 R **24 Claims**

1. A suspension and steering assembly for a snowmobile ski, said assembly comprising telescoping strut members for connecting said ski to said body, said strut members including a first strut member having a bottom end suitable for connection with said ski and a second strut member slidingly connected to said first strut member and adapted to telescopically receive the latter member, means for preventing relative rotation between said first and second strut member, means for rotatably mounting said second strut member in a snowmobile, a coil spring, and shock absorbing means disposed within



said strut members wherein one end of said coil spring resiliently engages said first strut member in such a manner that said first strut member is biased towards a position out of said second strut member.

3,931,863

NOISE REDUCTION DEVICE FOR AUTOMOTIVE VEHICLES

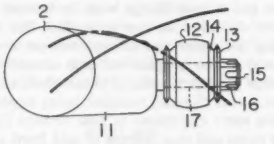
Yukio Sugiyama, and Tsuyoshi Sumi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Aug. 1, 1974, Ser. No. 493,845

Claims priority, application Japan, Dec. 3, 1973, 48-134269

Int. Cl.² B60K *23/04*

U.S. Cl. 180—71 **5 Claims**



1. In a noise reduction device for an automotive vehicle having a body-frame, a rear axle housing with a differential carrier, a mounting pin extending from said housing and a lateral control rod connected between said body-frame and said pin, the improvement wherein said noise reduction device comprises a weight fixedly mounted at the connection point between said lateral control rod and said pin.

3,931,864

AIR SUSTENSION PROPULSION

William Edouard Desbarats, 1577 Watts St., Chambly, Quebec, J3l 2Z3, Canada

Filed Jan. 27, 1975, Ser. No. 544,552

Int. Cl.² B60V *1/14*

U.S. Cl. 180—116 **11 Claims**

1. A vehicle having a body, means carried by the body providing a source of pressurized air, at least one nozzle means in the bottom of the vehicle body for directing a stream

of the pressurized air from the body to support and propel the vehicle, the stream directed from the body at an acute angle, to the bottom, and at least one deflecting surface on the bottom of the body, located relative to the nozzle means to receive the stream, when deflected off the surface being traversed by the vehicle, and to deflect it back toward the traversed surface.

3,931,865

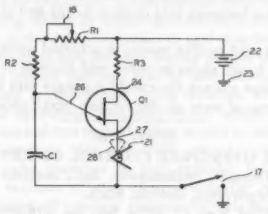
MOSQUITO REPELLANT APPARATUS

Robert Levitt, 5733 N. Sheridan, Chicago, Ill. 60660

Continuation of Ser. No. 291,747, Sept. 25, 1972, abandoned. This application Mar. 18, 1974, Ser. No. 452,043

Int. Cl.² A01N *23/00*

U.S. Cl. 181—.5 **3 Claims**



1. Electronic apparatus for repelling mosquitos that tend to bit humans,

said apparatus comprising:

attracting means not in conjunction with killing means for attracting male mosquitos, said attracting means comprising

relaxation oscillator means for generating a frequency signal;

non-directional means for broadcasting said generated frequency signal;

said frequency attracting male mosquitos;

resistor capacitor network means for varying said frequency by varying the resistance in said resistor capacitor network means to thereby obtain the optimum frequency for attracting male mosquitos;

battery means for energizing said oscillator means, whereby said apparatus is completely portable;

means for selectively connecting said oscillator means to said battery means;

plastic case means enclosing said apparatus; and

means for attaching said case to the clothing of the user; whereby the user has hands-free apparatus acting to repel mosquitos that tend to bite humans.

3,931,866

MOTOR VEHICLE SAFETY DEVICES

Takezo Takada, Hikone, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

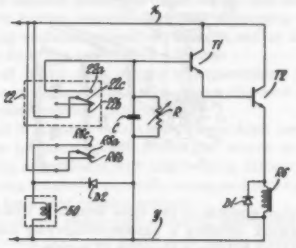
Division of Ser. No. 260,872, June 8, 1972, Pat. No. 3,825,205, which is a continuation-in-part of Ser. No. 157,562, June 28, 1971. This application Feb. 15, 1974, Ser. No. 442,935

Claims priority, application Japan, July 14, 1970, 45-069730; Aug. 27, 1970, 45-084724; Oct. 6, 1970, 45-087139; Oct. 14, 1970, 45-090684

Int. Cl.² B60R *21/10*

U.S. Cl. 180—82 C **8 Claims**

1. An automatic locking safety belt mechanism comprising a safety belt movable between withdrawn and retracted positions, belt retraction means normally urging said belt toward its retracted position, braking means for alternatively releasing or locking said safety belt against withdrawal, an inertia switch, an RC timing circuit including a timing capacitor and a resistor, brake activating means including a braking solenoid operatively connected to said braking means and having a normal first position in which it deactivates said braking means for withdrawal of said safety belt, and a second position in which it activates said braking means to a safety belt locking position, a relay solenoid responsive to the voltage on said capacitor being within a predetermined range for bringing said braking solenoid to its second position, whereby to lock said safety belt through said braking means, and means responsive



to the actuation of said inertia switch for imparting a voltage to said capacitor within said predetermined range, the charge on said capacitor changing through said resistor upon deactuation of said inertia switch to change said voltage to a value outside said predetermined range, said capacitor and resistor being operative to provide a selectively-controlled predetermined timing interval following the deactuation of said inertia switch and prior to deactivating of said braking means by said braking solenoid.

3,931,867

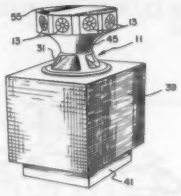
WIDE RANGE SPEAKER SYSTEM

Arthur A. Janszen, Belmont, Mass., assignor to Electrostatic Research Corporation, Beverly, Mass.

Filed Feb. 12, 1975, Ser. No. 549,393

Int. Cl.² H05K *5/00*

U.S. Cl. 181—155 **8 Claims**



1. A wide range speaker system comprising:

a base member defining an air chamber which is acoustically sealed except for an upwardly facing opening;

mounted over said opening, a cone type woofer having a downwardly facing cone with attached cylindrical voice coil, a magnetic structure forming a cylindrical magnetic gap providing a radial polarizing field for said voice coil and a relatively open basket structure extending upwardly from said opening for supporting said magnetic structure, said cone being flexibly connected to said basket structure around the periphery of said cone;

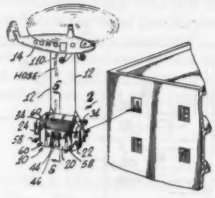
supported by said basket structure, diffuser means providing a reflecting surface for midrange acoustic components radiated from the back side of said cone, said surface being generally in the shape of an inverted cone which curves outwardly in radial section as it rises from said woofer; and

a circular array of outwardly facing tweeter elements mounted around the periphery of said diffuser just above said reflecting surface.

3,931,868
EMERGENCY RESCUE DEVICE

Charles P. Smith, Jr., 336 N. Palm Drive, Beverly Hills, Calif. 90210

Filed Aug. 12, 1974, Ser. No. 496,335
Int. Cl.[2] A62B 1/02
U.S. Cl. 182—63 8 Claims

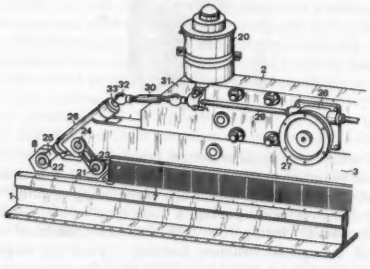


1. A rescue gondola of the class described which includes:
a framework defining a passenger-carrying compartment capable of holding a plurality of people;
a covering for said framework;
means connected to said framework for suspending said compartment beneath an aircraft that directs a large flow of air downwardly; and
movable vanes mounted on said compartment to intercept said downwardly directed flow of air, said vanes being adjustable from inside said compartment to apply a horizontally directed force to said compartment, whereby said compartment may be aligned with an opening in a vertical wall of a building.

3,931,869
BRAKING DEVICE FOR RAILROAD BOGIE RUNNING AT HIGH SPEED

Roger Fagel, Marcinelle, Belgium, assignor to Ateliers de Constructions Electriques de Charleroi (ACEC), Belgium

Filed June 7, 1974, Ser. No. 477,288
Claims priority, application Belgium, June 12, 1973, 5147; Nov. 29, 1973, 5545
Int. Cl.[2] B61H 7/00; F16D 65/34
U.S. Cl. 188—41 2 Claims

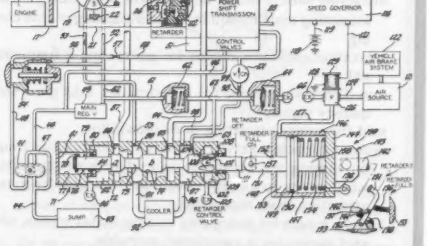


1. A braking device for a railroad bogie which supports a vehicle above a rail comprising:
a. a fixed part integrally connected with the bogie;
b. a movable part suspended from said fixed part, said movable part having a lower side;
c. a series of electromagnets suspended from said lower side of said movable part and being movable with said movable part;
d. a pair of friction brake shoes, one of said pair of friction brake shoes being disposed adjacent to one end of said series of electromagnets the other of said pair of friction brake shoes being disposed adjacent to the other end of said series of electromagnets, said friction brake shoes also being suspended from said lower side of said movable part and being movable therewith, said friction brake shoes extending a greater distance from said lower side and extending closer to the rail than said electromagnets;
e. means for moving said movable part from a position adjacent to said fixed part and spaced from the rail to a position spaced from said fixed part and adjacent said rail such that said friction brake shoes contact said rail but such that a small air gap exists between the electromagnets and the rail;
f. plural means on said movable part displaceably mounting said friction brake shoes for displacement relative to said movable part, each of said plural mounting means mounting one of said friction brake shoes;
g. motive means on said fixed part;
h. means for transmitting motive force from said motive means to said mounting means said transmitting means extending between said motive means and said mounting means;
i. whereby said motive means is actuated upon wear of the friction brake shoes to move said friction brake shoes in a direction toward the rail to maintain said small air gap regardless of wear on the friction brake shoes.

3,931,870
ENGINE OVERSPEED CONTROL OF RETARDER

James A. Memmer, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed June 12, 1974, Ser. No. 478,455
Int. Cl.[2] F16D 57/02
U.S. Cl. 188—296 6 Claims



1. In a hydrodynamic retarder; a drive member; hydrodynamic retarder means having a stator and a rotor operatively connected to said drive member in a retarder chamber operative on the supply of fluid to said chamber to retard said rotor; control valve means having a valve member movable between a retarder off position and a retarder full on position operative respectively to empty said retarder chamber and to fill said retarder chamber; speed governor means operatively connected to said drive member operative in response to a predetermined overspeed to provide an overspeed signal; control means having a manual actuator member movable between a manual retarder off position and a manual retarder on position and linkage means connecting said manual actuator member to said valve member and including motor means having a pair of relatively movable motor members movable between an automatic retarder off position and an automatic retarder on position and having normal biasing means to normally apply a force to position said motor members in one of said automatic retarder on position and said automatic retarder off position and signal biasing means connected to said governor means for operation in response to said overspeed signal to move said motor members to the other of said automatic retarder on position and said automatic retarder off position with a force and positive stop means to limit movement of said motor members in said automatic retarder off position, one motor member connected to said manual actuator member for conjoint movement of said one motor member and said man-

ual actuator, the other motor member connected to said valve member for conjoint movement of said other motor member and said valve member, linkage biasing means biasing said manual actuator member to said manual retarder off position with less force than the force moving said motor means to said automatic retarder off position and actuator stop means to limit movement of said manual actuator member in said manual retarder off position and said control means operative when said motor means is biased by one of said normal and signal biasing means to said automatic retarder off position, in response to manual force moving said manual actuator member from said manual retarder off position to said manual retarder on position against said linkage biasing means to act through said linkage means with said motor means positive stop means engaged to positively manually move said valve member from said retarder off position to said retarder full on position and on relaxation of said manual force to permit said linkage biasing means to return said manual actuator member from said retarder full on position to said retarder off position under the force of said linkage biasing means transmitted by said linkage means through one of said normal and signal biasing means to move said valve member to retarder off position and operative when said motor means is moved by one of said normal and signal biasing means in response to said overspeed signal to said automatic retarder on position to move said valve member to said retarder full on position against the reaction of said manual actuator member in its manual retarder off position against said actuator stop means or other manually held position to provide the reaction for the motor means to move said valve member from retarder off to the full retarder on position.

3,931,871

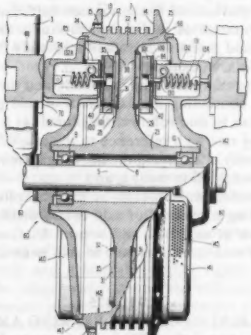
DISC BRAKE, HUB AND WHEEL ASSEMBLY

Thomas C. Martin, 54 Fayette St., Boston, Mass. 02171

Continuation of Ser. No. 297,347, Aug. 10, 1972, Pat. No. 3,825,179, which is a continuation of Ser. No. 61,258, Aug. 5, 1970, which is a continuation-in-part of Ser. No. 849,312, Aug. 12, 1969, abandoned. This application July 15, 1974, Ser. No. 488,314

Int. Cl.² F16D *55/228*

U.S. Cl. 188—344 **19 Claims**



1. A disc brake and wheel assembly for a vehicle having a fork with legs interconnected at the free end by an axle comprising:

a wheel having a hub with an aperture for receiving the axle and positioning the hub intermediate the legs of the fork;

a radially extending annular rotatable web having a cylindrical center coaxial with said axle;

means supporting said web for rotation relative to said axle;

a pair of face plates having their outer periphery terminating adjacent and movable relative to the web, and defining an enclosed space with a part of the web;

said web having a flanged outer end including tire support means;

a pair of annular bearing surfaces within said space;

said web having opposite faces for supporting respective bearing surfaces normal to, radially and at a fixed distance from the axis of said wheel;

a pair of brake shoe means with associated brake pad means, each said brake shoe means disposed adjacent a respective bearing surface;

each said brake shoe means including at least one hydraulic means for moving said brake pad means to and from braking engagement with said bearing surface;

and biasing means for normally urging said brake pad means away from said bearing surface;

said pair of face plates each including restraining means for supporting each said brake shoe means against rotation with said web;

said brake shoe means and restraining means aligned with said bearing surface, said said brake shoe means positioned between said bearing surface and said restraining means.

3,931,872

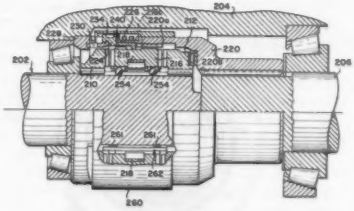
REVERSIBLE OVERRUNNING CLUTCH WITH AUTOMATIC SHIFT CONTROL AND FRICTION REDUCING MEANS

Walter L. Dissett, Southfield, Mich., assignor to Aspro, Inc., Westport, Conn.

Filed June 13, 1974, Ser. No. 478,933

Int. Cl.² F16D *41/00, 11/04;* **F16C** *17/02*

U.S. Cl. 192—43 **8 Claims**



1. In a reversible overrunning clutch means for driving an overrunning first motor vehicle axle when the rotational speed thereof fails to exceed the speed of a second axle by a predetermined slight amount, said clutch means including a housing (**204**); an output shaft (**202**) journalled in said housing, said output shaft being adapted for connection with one of said axles; a rotary input shaft (**206**) arranged for rotation adjacent said output shaft; reversible overrunning clutch means operable to connect said input shaft with said output shaft, including forward and reverse annular clutch members (**210, 212**) secured to said output shaft in axially spaced relation, an annular central driver member (**216**) rotatably mounted on said output shaft in spaced relation relative to, and axially slidable between, said annular clutch members, said central driver member having at opposite ends thereof clutch teeth of the self-disengaging overrunning type adapted to engage corresponding clutch teeth on said annular clutch members, respectively, friction drag spring means (**218**) connected between said output shaft and said central driver member for resisting rotational movement of said output shaft, and direction-responsive operating means (**216c, 220a**) connected between said input shaft and said central driver and said central driver

member for axially shifting said central driver member in a direction corresponding with the direction of rotation of said driving means; and automatic shift control means (228, 230, 224) responsive to the direction of rotation of said driving means for positioning said central driver member in a readiness position immediately adjacent the corresponding one of said annular clutch members to insure the correct directional operation of said clutch means; the improvement which comprises means for reducing the axial friction between said friction drag spring means and said output shaft including

a. a sleeve arranged concentrically between said central driver member and said output shaft, said friction drag spring means being arranged for radially directed frictional engagement between the inner peripheral surface of said central driver member and the outer peripheral surface of said sleeve;

b. means connecting said sleeve for non-rotatable axial sliding movement relative to said output shaft; and

c. friction reducing means connected with, and constrained against axial displacement relative to, said sleeve for reducing the axial component of friction between said sleeve and said output shaft.

3,931,873

SYNCHRONIZATION MECHANISM FOR CHANGE-SPEED TRANSMISSIONS

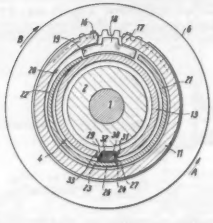
Gerhard Koch, Oberboihingen, and Hans Heinemann, Weissach, both of Germany, assignors to Dr. -Ing. H.c.F. Porsche Aktiengesellschaft, Germany

Filed Apr. 4, 1974, Ser. No. 458,031

Claims priority, application Germany, Sept. 28, 1973, 2348795

Int. Cl.² F16D *11/00*

U.S. Cl. 192—53 C **11 Claims**



1. A synchronization mechanism, especially for change-speed transmissions of motor vehicles, in which a shifting sleeve provided with shifting teeth means is retained at a shifting sleeve carrier means fixedly arranged on a transmission shaft and is operable to be coupled against the action of at least one friction means producing synchronism, with a coupling member of the gear to be engaged, which is provided with shifting teeth means, the friction means including a slotted and spring synchronizing ring means cooperating directly with the shifting teeth means of the shifting sleeve, characterized in that the end surfaces of the shifting teeth means of the shifting sleeve are so constructed that the friction means become again ineffectual, after the synchronization operation is completed, before the shifting teeth means of the shifting sleeve come into engagement with the shifting teeth means of the coupling member.

3,931,874

SELF-ACTUATING FRICTION-CLUTCH ASSEMBLY

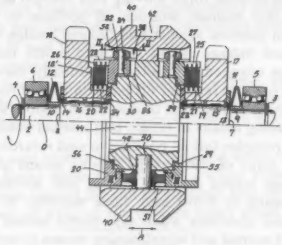
Siegfried Braun, Friedrichshafen, and Fritz Herbst, Bermatingen, both of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Oct. 29, 1974, Ser. No. 519,001

Claims priority, application Germany, Oct. 27, 1973, 2353983

Int. Cl.² F16D *7/00*

U.S. Cl. 192—54 **10 Claims**



1. A self-actuating friction-clutch assembly for temporarily interconnecting two coaxial members for joint rotation, comprising:

a body rigid with one of said members axially spaced from the other of said members;

a transverse pressure plate on said body confronting said other of said members across an intervening gap, said pressure plate being mounted on said body with freedom of limited relative axial and angular displacement;

first and second friction means in said gap respectively connected with said pressure plate and with said other of said members for operative interengagement upon an axial shift of said pressure plate toward said other of said members from a normal position in which said first and second friction means are spaced apart;

an axially shiftable control member mounted on said body in fixed relative angular position;

coupling means linking said control member with said pressure plate for shifting the latter toward said other of said members upon a displacement of said control member from a neutral position, with resulting interengagement of said first and second friction means sufficient to translate relative rotation of said members into a rotary disalignment of said pressure plate and said body from a normal relative rotary position;

first coacting cam means on said body and on said pressure plate for continuing the axial shift of said pressure plate in response to said rotary disalignment at a progressively increasing rate with reference to the rate of relative rotation, thereby intensifying the interengagement of said first and second friction means; and

second coacting cam means in said coupling means for accelerating a reversal of said rotary disalignment upon separation of said first and second friction means by a return of said control means to said neutral position.

3,931,875

SELF-ALIGNING CLUTCH BEARING ASSEMBLY

Eli M. Ladin, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

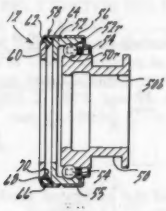
Filed Dec. 26, 1973, Ser. No. 427,486

Int. Cl.² F16D *23/14*

U.S. Cl. 192—98 **32 Claims**

1. In a clutch having input and output members normally operatively coupled to rotate together about the clutch axis and means for operatively uncoupling said two members comprising a plurality of pivotally mounted release levers on the clutch, said release levers having actuating portions thereof

arranged to lie approximately on a circle which is at least approximately perpendicular to and at least approximately coaxial with the axis of the clutch, a clutch release bearing shiftable axially of the clutch to engage the actuating portions of said release levers and operate said levers so as to operatively uncouple said two members, said clutch release bearing comprising: an inner race means comprising a raceway; an outer race means comprising a raceway; a plurality of antifriction bearing elements constrained between said two race means and riding in the raceways thereof; annular wear plate means disposed in a plane perpendicular to the axis of said bearing and arranged to engage the actuating portions of said release levers for operating the latter; and means for supporting said wear plate means on said outer race means comprising an annular axially-extending portion affixed to said outer race means having a free end and a resilient annular element interposed between and affixed to said free end of said annular axially-extending portion and to said wear plate means; said wear plate means, said outer race means and said resilient annular element being arranged and constructed such that the bulk of said resilient annular element is disposed axially intermediate the location at which it engages said wear plate means and the location at which it engages said annular axially-extending portion, the bulk of said resilient annular element being radially offset from the point of contact between said wear plate means and the actuating portions of said release levers.



3,931,876

CLUTCH DISK FOR MOTOR VEHICLE MAIN CLUTCHES

Bruno Beeskow, Bietigheim; Günter Wörner, Rommelshausen, and Peter Schrape, Stuttgart, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

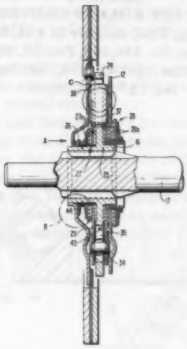
Filed Nov. 11, 1974, Ser. No. 522,980

Claims priority, application Germany, Nov. 13, 1973, 2356559

Int. Cl.² F16D 3/14

U.S. Cl. 192—106.2 **20 Claims**

1. A clutch disk for motor vehicle main clutches which comprises a disk means carrying friction linings and torsionally elastically arranged with respect to a hub means, several spring means with different characteristics being provided in window means of one of the two parts consisting of a hub flange forming part of the hub means, on the one hand, and of the disk means and a lateral member rigidly connected therewith, on the other, which cooperate with corresponding larger window means provided in the respective other of said two parts, a friction damping means coordinated to said spring means whose start of operation is determined by control means, characterized in that for a multi-stage damping within the operating range in which only the friction of the friction damping means is effective which has been engaged last, two friction damping means are provided each including friction disk means, the first friction damping means being operatively connected with the hub flange by means of its control spring means arranged in a window means of the hub flange and by means of the coordinated friction disk means provided with its control means, and the second friction damping means being coupled to the lateral members by means of its control spring means arranged in a window means of the lateral members



and by means of the coordinated friction disk means provided with its control means.

3,931,877

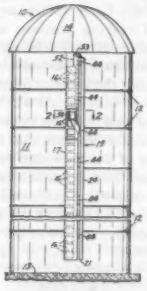
MATERIAL DIVERTER STRUCTURE

LeMar L. Albaugh, Anamosa, Iowa, assignor to Anamosa Farm Systems, Inc., Anamosa, Iowa

Filed Apr. 15, 1974, Ser. No. 460,728

Int. Cl.² B65G 11/02, 65/38

U.S. Cl. 193—15 **14 Claims**



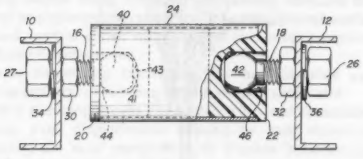
1. A material carrying means for a structure having a plurality of vertically spaced doorways and enclosure means covering the doorways with the enclosure means providing a passageway to the doorways comprising: means having a passage for carrying material to a location, material diverter means located within said enclosure means for receiving material and directing the material from said structure through one of said doorways to said passage of the means for carrying material to a location whereby the material moves through the one of said doorways, the diverter means and the means having a passage to the location, upright track means located in the passageway and mounted on the enclosure means, carriage means cooperating with the track means to guide the carriage means along the track means, and means mounting the material diverter means on the carriage means whereby the material diverter means moves with the carriage means to a position aligned with a selected doorway, said means mounting the material diverter means including upright pivot means mounting the material diverter means on the carriage means to allow pivotal movement of the material diverter means away from the se-

lected doorway into the passageway whereby the material diverter means is free to be moved along the passageway.

3,931,878
SANITARY ROLLER CONVEYOR

Ralph Payne, Irving, Tex., assignor to FEI, Inc., Dallas, Tex.

Continuation of Ser. No. 334,469, Feb. 21, 1973, abandoned.
This application Apr. 4, 1974, Ser. No. 457,859
Int. Cl.² B65G 39/09
U.S. Cl. 193—37 **6 Claims**



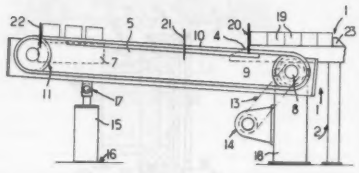
1. A roller conveyor system comprising:
a pair of spaced apart rails,
a plurality of opposed metal stub shafts connected at spaced apart locations along the interior sides of said rails,
hollow cylindrical rollers disposed between said rails,
low friction plastic bearing members rigidly mounted in the ends of said hollow rollers,
said bearing further comprising means for preventing foreign liquid and solid substances from entering the hollow cylindrical rollers,
blind right circular cylindrical sockets formed in the center of the outer ends of each of said low friction plastic bearing members, and spaced a predetermined distance apart,
the blind sockets of each roller having inner end surfaces extending concavely from within, and
generally spherical bearing portions integrally formed on the ends of said stub shafts for being received within said blind sockets, said bearing portions being dimensioned to bear directly against the interior plastic walls of said blind sockets of the low friction plastic bearing members to rotatably suspend said bearing members and the hollow rollers carried thereby between said rails while preventing the accumulation of debris within said blind sockets,
said bearing portions having truncated inner end surfaces positioned more than the predetermined distance apart so that the end surface of each of the bearing portions and the end surface of its respective blind socket to define a space therebetween.

3,931,879
AUTOMATIC DEVICE FOR SYSTEMATICALLY PLACING ELONGATED PRODUCTS ON A CONVEYOR

Alex Javerzat, St Nazaire, and Fernand Delplanque, Nice, both of France, assignors to Mecaval International, Saint Chamond, France

Filed Nov. 9, 1973, Ser. No. 414,296
Claims priority, application France, Mar. 30, 1973, 73.19951, Aug. 11, 1972, 72.29386
Int. Cl.² B65G 47/08
U.S. Cl. 198—21 **12 Claims**

1. In a device for placing elongated products, such as pieces of sectional iron, bars or the like, on a conveyor formed of longitudinally spaced rollers, said device having storage means for a plurality of such elongated products remote from the roller conveyor and a feeding device intermediate the roller conveyor and the storage means for advancing the products to the roller conveyor, said feeding device having a longitudinal axis transverse to the longitudinal axis of the roller conveyor and at least two transversely spaced longitudinally extending product transfer means,
a. a pusher for advancing the products from storage to the feeding device, said pusher being operable to advance the products in a direction transverse to their longitudinal axes at a selected rate of speed,
b. drive means for advancing the product transfer means of the feeding device at the same selected rate of speed at which the pusher advances the products from storage,
c. means for depositing the elongated products transversely on the feeding device transfer means one at a time at uniformly spaced time intervals, to provide on the transfer means as it advances a transverse layer of elongated products disposed in uniformly spaced parallel relation,
d. means automatically operable for transferring periodically selected quantities of the elongated products from the layer of products on the transfer means to the roller conveyor, while maintaining the uniformly spaced paral-

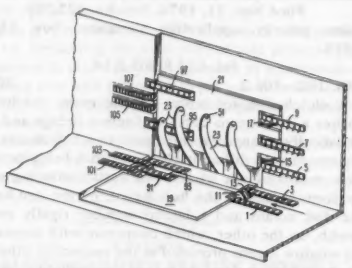


lel relation of the elongated products, said automatic means including
i. actuating means for raising the feeding device to a position above the upper plane of the roller conveyor and for lowering the feeding device to a position below the upper plane of the roller conveyor and
ii. detector means on the feeding device to cause the actuating means to raise and lower the feeding device in response to the advancement of the layer of elongated products, said detector means being operable to cause the feeding device to be moved to its lower position to deposit elongated products on the roller conveyor, and to cause the feeding device to be moved to its upper position subsequent to the deposit of elongated products on the roller conveyor.

3,931,880
DOCUMENT HANDLING APPARATUS

Thad E. Ayer, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 13, 1974, Ser. No. 469,132
Int. Cl.² B65G 47/22
U.S. Cl. 198—29 **10 Claims**



1. Document handling apparatus comprising
a first plurality of endless belts moving in synchronism and with a first velocity upon which the documents are loaded in bulk and are disposed substantially vertical,
fluffing means to which the documents are delivered by said belts for accelerating the documents to a second velocity greater than said first velocity to thereby decompact the documents,
a plurality of separate document stabilizing blades insertable one at a time between groups of said documents for

stabilizing the motion of said decompacted documents, moving with said documents at said second velocity, and removable one at a time from between said groups of documents,

actuating means for cyclically inserting and removing said stabilizing elements from said documents,

jogging means for jogging said documents to align at least one edge of the documents, while being stabilized by said stabilizing elements,

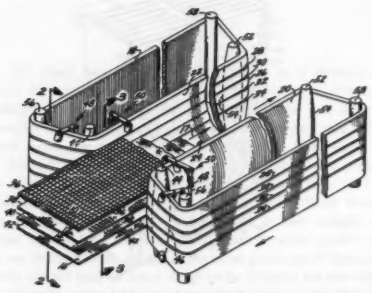
and a second plurality of endless belts moving in synchronism and with said first velocity for receiving and recompacting the jogged documents.

3,931,881

CONTINUOUS BELT SYSTEM HOLDING MULTIPLE LAYERS

Frederic W. Bickel, Burbank, and Richard L. Long, Manhattan Beach, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 2, 1973, Ser. No. 402,794
Int. Cl.² B65G *15/14*
U.S. Cl. 198—165 **3 Claims**



1. A continuous belt systems for holding multiple layers, said system comprising:

a pair of endless belts having vertical parallel spaced surfaces defining a path of travel;

said surfaces having gripping means thereon to retain multiple stacked and spaced layers therebetween;

said gripping means comprising closed slits in said surfaces;

means applying said gripping means to said layers at the start of said path of travel by opening said slits to permit insertion therein of edges of said layers and closing said slits after said edges are inserted;

said means for opening said slits comprising a convex bulge device for flexing the midportions of each belt inwardly toward each other including rollers on the top and bottom inside edges of said belts and rollers at the midsection of said belts on the outside surface thereof; and

means releasing said layers from said gripping means at the end of said path.

3,931,882

MODULAR ARTICLE CONVEYOR

Carl Gilbert Richard Ossbahr, Risbrinksvagen 36, Linkoping, Sweden

Filed Apr. 30, 1974, Ser. No. 465,629
Claims priority, application Sweden, May 4, 1973, 7306328
Int. Cl.² B65G *15/14*
U.S. Cl. 198—165 **3 Claims**

1. A conveyor which can have its driving apparatus mounted wholly beneath a structure that defines a supporting surface such as a floor or a table top and by which articles can be transported over and along said surface, said conveyor being characterized by:

A. a pair of elongated, endless belt elements;

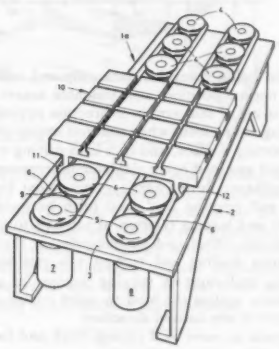
B. two pairs of pulley-like members, one pair for each of said belt elements and around which the belt element is trained;

C. means constraining the pulley-like members to rotation on spaced apart axes normal to said surface and fixing the locations of the pulley-like members in such relation to one another that

1. all of said pulley-like members are located beneath said structure and are disposed in a common plane that is parallel to said surface,

2. each of said belt elements has straight inner and outer stretches extending lengthwise between its pulley-like members, the inner stretches of the two belt elements being adjacent to one another and their outer stretches being remote from one another, and

3. at least one stretch of each belt element is parallel to its corresponding stretch of the other belt element;



D. means for rotatably driving one of the pulley-like members of each pair thereof, said means constraining said driven pulley-like members to rotate at substantially equal circumferential speeds but in opposite directions so that said parallel stretches of the two belt elements move lengthwise in the same direction; and

E. a carriage having

1. an article carrying portion adapted to overlie a portion of said surface of said structure and

2. belt engaging members fixed to said article carrying portion and projecting downwardly therefrom to extend through elongated slots in said structure, said belt engaging members having bottom portions that define elongated, laterally oppositely opening grooves in which said parallel stretches of the two belt elements are receivable to support the carriage and frictionally drive it in the direction of movement of said parallel stretches.

3,931,883

HORIZONTAL CONVEYOR LOAD MOVING APPARATUS

Edwin J. Willard, East Longmeadow, and Leslie E. Carpenter, Jr., Southwick, both of Mass., assignors to Longview Fibre Company, Longview, Wash.

Filed June 21, 1974, Ser. No. 481,762
Int. Cl.² B65G *25/04*
U.S. Cl. 198—218 **9 Claims**

1. Apparatus for moving a rigid faced load along a load supporting surface comprising

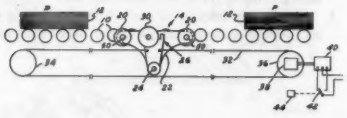
a carriage member,

tracking means supporting the carriage for guided movement back and forth along a predetermined path of travel below the plane of said surface,

a load propelling member having an upstanding lever arm pivoted at its lower end on said carriage and a contact roll

carried at the upper end of the arm for engaging a load, said roll having means for rotation only during carriage movement in an opposite direction to that of intended load travel,

means normally maintaining said arm in a vertical position and yieldably holding said roll elevated above the pivotal axis of the arm with the uppermost roll surface closely adjacent to and above the plane of said load supporting surface and the roll axis adjacent to and offset, in the intended direction of load travel, forwardly of a plane extending radially from the pivotal axis of said arm in substantially perpendicular relation to the load supporting surface.



said arm being swingable forwardly and rearwardly of its said normal position, said yieldable means resisting pivotal swing of said arm in a direction opposite that of the carriage movement when said roll engages a load on said supporting surface, and in a load driving engagement of the roll and load being yieldable in response to variations in resistance during carriage movement for a shifting of said roll position back and forth between a forwardly offset and leading relation of roll axis to arm axis and a rearwardy offset and trailing relation thereof, said roll between leading and trailing axis positions rising and failing and exerting varying degrees of upward tilting pressure against the load to assist continued movement thereof in the desired direction.

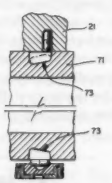
and means to move said cariage back and forth along said path of travel.

3,931,884

APPARATUS FOR TRANSPORTING AND ORIENTING CAPSULES

Edward M. Ackley, Stone Harbor, N.J., assignor to R. W. Hartnett Company, Philadelphia, Pa.

Filed Sept. 24, 1973, Ser. No. 399,817
Int. Cl.² B65G 47/14
U.S. Cl. 198—287 **1 Claim**



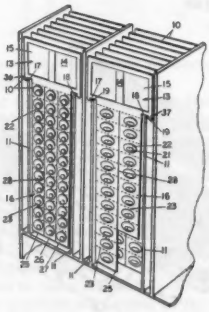
1. In a capsule turning apparatus, the combination which comprises: a continuously rotatable capsule transporting cylinder having a plurality of elongated upstanding spaced-apart pockets having radially extending portions arranged to receive the capsules in upstanding positions therein, means for rotating said cylinder, means providing a plurality of elongated transverse pocket portions which extend in a direction arranged generally transversely of the path of movement of said capsules, each said transverse pocket portion intercommunicating with one of said upstanding pockets by way of a shaped transfer surface, means for causing tilting movement of said capsules out of said upstanding pockets and into said transverse pocket portions and thereby transferring said capsules, while said cylinder is rotating, from said upstanding pocket portions to said transverse pocket portions, a pair of separate transporting cylinders rotating tangent to each other, said upstanding pockets being carried in one of said cylinders and said transverse pocket portions being carried in the other, and said pockets and pocket portions intercommunicating with one another by coming together incident to rotation of said cylinders.

3,931,885

MEDICINE DISPENSING SYSTEM

Edmond P. Nahill, 56 Pleasant St.; James C. Nahill, 9 Sunset Ave.; William A. Nahill, 10 Glen Ave., and Arthur Nahill, 51 East St., all of, Methuen, Mass. 01844

Filed Apr. 30, 1973, Ser. No. 355,960
Int. Cl.² B65D 5/52, 73/00
U.S. Cl. 206—44 R **1 Claim**



1. In combination:

a portable cart having side and end walls, at least one compartment formed therein, each compartment having at least two parallel upright support members, extending vertically therein, and having parallel horizontal upper edges spaced a predetermined width apart,

and a plurality of compartmentalized medicine-holding packages, each package comprising a generally T-shaped body having

a lower, medicine-carrying portion of flexible, low-cost, non self-supporting materials having bubbles therealong, for containing a pill, separated by the tear lines, for permitting each successive lowermost bubble to be separated therefrom, said sheet being of less width than the width between said supports to hang therebetween and

an upper index card portion of relatively rigid, self-supporting, material of predetermined greater width than the width of said lower portion and than the width between said supports; said card having a pair of oppositely disposed, downward facing bottom edges each forming a bearing surface extending beyond the said horizontal edges of said supports and supported thereon and having a pair of integral downward projecting ears, each outside one of the bearing surfaces of said bottom edges;

said bearing surfaces supporting said card portion in visible, upright, readable position; supporting said lower portion in limp, depending position between said supports and supporting said packages for individual free removal from said cart in a vertical path and

said ears preventing inadvertent twisting and dropping of said packages to the bottom of said cart.

3,931,886
INNER BAG FOR CONTAINERS

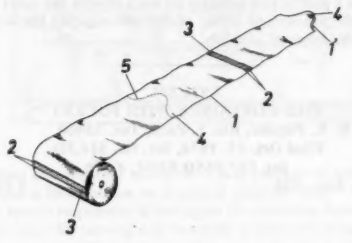
Akira Yamauchi, 121, Tatsumachi, Sasayamo-cho, Taki, Hyogo, Japan

Continuation of Ser. No. 358,282, May 8, 1973, abandoned, which is a continuation of Ser. No. 125,188, March 17, 1971, abandoned. This application Dec. 16, 1974, Ser. No. 532,857

Claims priority, application Japan, Mar. 17, 1970, 45-25737

Int. Cl.[2] **B65D** *33/14*, *85/67*; **A61J** *9/00*

U.S. Cl. 206—390 **4 Claims**



1. An inner bag for a container such as a nursing bottle formed in pairs, said pairs of inner bags being continuous in the shape of an elongated flexible plastic tube and defined by a plurality of sealing lines formed transversely of said tube and spaced apart by a predetermined distance longitudinally of said tube, a discontinuous cut line formed in the middle of each of said sealing lines transversely of said tube and a discontinuous cut line in the shape of a continuous wave-like curve formed transversely of said tube at the middle of the portion defined by each two adjacent spaced apart sealing lines, so as to provide at least two crest portions at the opening of each of said pair of inner bags to be formed on the opposite sides of said wave-like cut line, said inner bags thus being adapted to be separated from each other when torn off along the cut lines, wherein the crests are substantially large with an elongated periphery with an effective peripheral length for folding and, wherein the length of each crest portion in the longitudinal direction of the tube is at least equal to the distance between the troughs defining two crest portions.

3,931,887
PACKAGING STRUCTURE FOR ITEMS PROVIDED ON WIRES OR CORDS

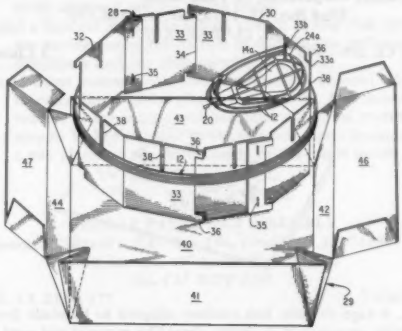
Frederick R. Beck, Valparaiso, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Filed July 22, 1974, Ser. No. 490,582

Int. Cl.[2] **B65D** *5/50*, *85/42*

U.S. Cl. 206—419 **3 Claims**

1. In a package including a walled container which can be opened at the top and has a closed bottom for packaging therein a string-of-lights product having elongated wire conductor means therewith and a plurality of electric lamp sockets electrically connected thereto, the combination including a removable liner positionable within said container comprising a wall of generally cylindrical shape with a top edge and standing upright in said container and spaced away from but within the wall of said container, a string-of-lights product comprising wire conductor means and a plurality of assemblies, each assembly electrically connected to said wire conductor means at predetermined positions over the length thereof, with each assembly including a lamp socket, electrical connector means, and means associated with the socket, said liner having therewith means for maintaining said elongated wire conductor means on the outside of said liner intermediate the top edge and the bottom of the wall of said liner, and said liner having a plurality of slots therein, with each slot extending from the top edge of said liner downwardly a predetermined distance into the wall of said liner and corresponding at least in number to said assemblies for said product, with said wire conductor means insertable into and positioned in a slot while said product is packaged in said container, and with each said assembly being positioned inside said liner and resting on the bottom of the container, said product being removable from said container by unwrapping the wire conductor means from around the liner and removing said assemblies from the container by withdrawing each assembly upwardly out of the container to in turn withdraw the wire conductor means upwardly and out of a corresponding slot, with said upward movement of said wire conductor means and the assemblies being accomplished without impeding the wire conductor means on the outside of said liner as the total product is being removed from said container.



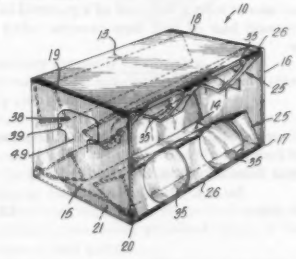
3,931,888
ARTICLE CARRIER

Wesley Samuel Fogel, Quebec, Canada, assignor to Dominion Glass Company Limited, Montreal, Canada

Filed Oct. 31, 1974, Ser. No. 519,743

Int. Cl.[2] **B65D** *65/10*

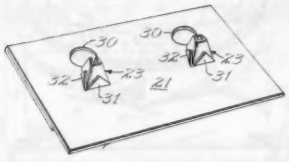
U.S. Cl. 206—434 **10 Claims**



1. An article carrier blank comprising a single sheet of paper stock of other foldable material defining a series of walls having parallel end edges and fold lines formed along a common axis on each side thereof, said series of walls comprising a first transverse wall, a top wall, a second transverse wall, a bottom wall and an attachment panel, all in series; an article retaining panel adjacent each side edge of said bottom wall and said top wall, each said article retaining panel having an article retaining panel section connected to and extending adjacent said side edge and a pressure applying panel section outwardly of said article retaining panel section and integrally formed therewith, an outer securing end margin integrally formed with said pressure applying panel section and extending outwardly thereof, said article retaining panel section being formed of a first and second section, spaced apart openings in said article retaining panel sections constituting article

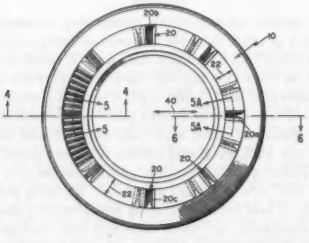
retaining cavities; said wall panels, section and securing end margins being defined by substantially parallel and transverse edges or fold lines.

3,931,889
TAPE CASSETTE HUB RETAINERS
Harry I. Roccaforte, Western Springs, Ill., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.
Filed Nov. 29, 1974, Ser. No. 528,270
Int. Cl.² B65D *85/67*
U.S. Cl. 206—493 **3 Claims**



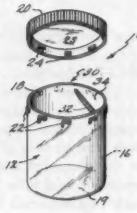
1. A tape cassette hub retainer adapted to be made from foldable paperboard or similar sheet-like material and used in conjunction with a cassette shipping and storage container, said hub retainer comprising:
a flat base panel;
at least one die cut, hinged post means formed in said base panel and spaced in said base panel to underlie at least one of the hubs in a tape cassette, said post means foldable outwardly from the plane of said base panel for engaging and retaining said hub of said tape cassette when in said container;
said post means comprising a generally rectangular shape having three sections formed as a part thereof including a center section of generally triangular shape having as its base a hinge line connecting said post means to said base panel; and
said three sections including a side flap hingedly connected to each of the remaining sides of said center section, said three sections folded outwardly from the plane of said base panel into at least a frustrum of a pyramid to engage and retain said hub of said tape cassette when in said container.

3,931,890
STACKABLE LID
Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.
Filed June 27, 1974, Ser. No. 483,644
Int. Cl.² B65D *21/02*
U.S. Cl. 206—508 **12 Claims**



1. A thin walled thermoformed plastic container lid comprising
a generally circular closure wall having upper and lower surfaces and an integral skirt extending generally downwardly from said closure wall,
a plurality of downwardly extending projections integral with said closure wall, said projections being angularly spaced about the center of said closure wall and lying within a generally annular region of said closure wall; and
means in the upper surface of said annular region defining an uninterrupted series of regularly spaced projection-receiving sockets between the projections, the angle between said projections in said annular space being an integer multiple of the angle between adjacent sockets so that a pair of said lids may be stacked with the outer ends of the projections of one of said lids engaging the sockets in the other of said lids.

3,931,891
PILL CONTAINER WITH POCKET
Stanley R. K. Peppler, Rte. 5, Paris, Tex. 75460
Filed Oct. 11, 1974, Ser. No. 514,316
Int. Cl.² B65D *83/04*, *41/06*
U.S. Cl. 206—538 **7 Claims**



1. A container for holding a plurality of discrete elements of predetermined dimensions therein, said container comprising
a. a main body member, said member having closed side and bottom portions and an open top and holding a plurality of said discrete elements therein,
b. a cap for closing the open top of said main body member,
c. a pocket member formed in said main body member, said pocket member having closed bottom and side portions and an open top and holding a plurality of said discrete elements therein separate from said plurality of said discrete elements held by said main body member, said pocket member being so located within said main body member that the open top of said pocket member is spaced from said cap when said cap closes the top of said main body member a distance less than said predetermined dimensions of said discrete elements so that elements from said pocket may not mix with elements in said main body member and vice-versa.

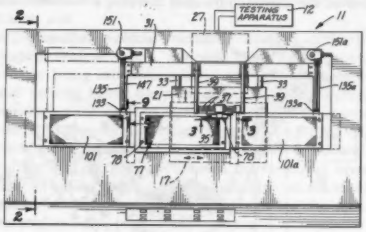
3,931,892
COMPONENT HANDLER WITH FLUID CONTROLLED MEMORY
Martin L. Sklena, Costa Mesa; Russell P. Balent, Balboa Island, and Phillip E. Greer, Tustin, all of Calif., assignors to GTI Corporation, Costa Mesa, Calif.
Filed May 24, 1974, Ser. No. 472,978
Int. Cl.² B07C *5/08*
U.S. Cl. 209—74 M **21 Claims**

1. A component handler for use with an apparatus which is adapted to perform an electrical test operation on an electrical component and to provide a signal which is related to such test operation, said component handler comprising:
holding means for holding the electrical component on which the electrical test operation is to be performed;

said holding means including means to establish electrical contact with the component being tested;

means to provide a signal related to the electrical test operation;

a body having a surface defining at least one passage in said body;



at least one member movable in said passage of said body from a first position to a second position; and

first means responsive to the signal for providing fluid under pressure for moving said movable member from said first position to said second position whereby the position of said at least one movable member is correlated with the test operation performed on the electrical component.

3,931,893

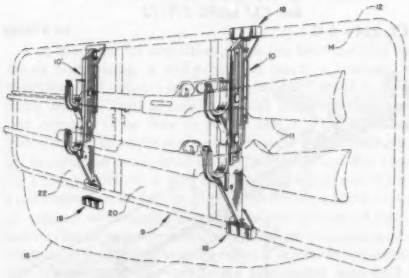
RIFLE MOUNTING RACK FOR SLIDING WINDOW ASSEMBLIES

Johnny C. Elkins, 1909½ Pulliam St., and Marvin C. Hanz, 423 S. Irving, both of San Angelo, Tex. 76901

Continuation-in-part of Ser. No. 256,509, May 24, 1972, and a continuation-in-part of Ser. No. 401,983, Oct. 1, 1973, Pat. No. 3,876,079. This application Feb. 24, 1975, Ser. No. 552,302

Int. Cl.² A47F *5/08, 7/00*

U.S. Cl. 211—64 **13 Claims**



1. In combination with a vehicle sliding window assembly having at least two window panes with at least one said pane being slidable respective to the other, wherein the glass is slidably captured within spaced opposed channels formed within a window frame of the assembly, a mounting rack for rifles comprising a pair of support members having means by which they are removably and slidably secured solely to the window frame in laterally space relationship to one another;

each support member comprising a first and second slide member; each slide member having a slidable surface formed thereon and an insert means which is inserted in captured relationship within one of the opposed channels of the window frame assembly;

cradle means outwardly disposed from and attached to one of said slide members for contributing to the support of a rifle;

guide means formed on said first and second slide members so that one said slide member can be guidably moved in aligned relationship respective to the other of said slide members;

each said insert means being arranged on each said slide member so that when one slide member is moved relative to the other, the insert means are moved towards and away from one another; said insert means being arranged in a common plane, with said cradle means being normally disposed relative to the plane;

and a fastener means connected to each of said slide member for increasing the friction of said slidable surfaces to effectively lock the slide members together;

said insert means being placed within the channel which receives the window glass by sliding the first member relative to the second member, after which the members may be locked together by the fastener means to support a gun placed in the cradle solely by the insert means.

3,931,894

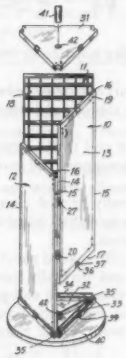
DISPLAY PANEL AND ASSEMBLY

Thomas V. Murphy, P.O. Box 156, Oradell, N.J. 07649

Filed Jan. 16, 1974, Ser. No. 433,743

Int. Cl.² A47F *5/02*

U.S. Cl. 211—177 **7 Claims**



1. A display assembly comprising

a a plurality of closed display assemblies arranged in vertically stacked relation,

b a plurality of display panels disposed in a predetermined closed geometric configuration; each of said display panels comprising

1 a flat panel provided with apertures for the reception of display fixtures,

2 at least one male hinge element of generally cylindrical configuration being provided along at least one side edge of said panel,

3 said male hinge element being integrally molded with said panel and connected thereto at one or more spaced areas,

4 said panel being recessed from said hinge element between said areas, and

5 at least one female hinge element of generally semicylindrical configuration provided along at least an opposite side edge of said panel and embracing an arc of at least slightly more than **180°** and accepted for snap-together attachment to a male hinge element of an adjacent display panel,

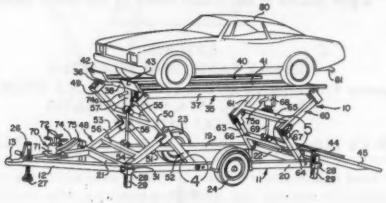
6 the axes of said hinge elements being substantially coincident with the outer back edge extremities of said panel to accommodate 180° hinged folding of a pair of connected adjacent display panels between abutted back-to-back and abutted edge-to-edge positions,

c a plurality of end cap members,
d said end cap members being formed to provide socket means having a geometric configuration corresponding to that of said plurality of panels and adapted for the endwise reception of said connected panels to receive said panels in said geometric configuration, and
e at least certain of said end cap members including means for maintaining alignment of corresponding panels of vertically adjacent display structures.

3,931,895
COLLAPSIBLE TRAILER HOIST

Samuel Grimaldo, 776 W. Sandoval, Thousand Oaks, Calif. 91360

Filed Nov. 1, 1974, Ser. No. 519,988
Int. Cl.² B67G *67/30*; B60P *1/04*
U.S. Cl. 214—1 A **16 Claims**



1. A collapsible trailer hoist comprising:
a. a main support;
b. a movable support movable between a lower position adjacent the main support and a raised position above the main support;
c. a collapsible front end frame interconnecting front portions of the main support and movable support and including,
c.1 a pair of laterally spaced elongated beams pivotally coupled to the movable support and having a set of normally free ends,
c.2 a pair of laterally spaced short beams coupled to the main support and pivotally coupled to intermediate portions of corresponding elongatged beams, and
c.3 an upper cross beam interconnecting the elongated beams and a lower cross beam interconnecting the short beams.
d. a collapsible rear end frame interconnecting rear portions of the main support and movable support; and,
e. control means operable to sequentially expand the front end frame and rear end frame to lift the movable support to its raised position, the control including a mechanical expander connected to and extending between the upper and lower cross beams of the front end frame, wherein when the front end frame is alternately collapsed and expanded, the elongated and short beams are generally parallel and mutually angled respectively.

3,931,896
BAR UNSCRAMBLER

Leonard Novis, Linden, Mich., assignor to Atlas Automation, Inc., Fenton, Mich.

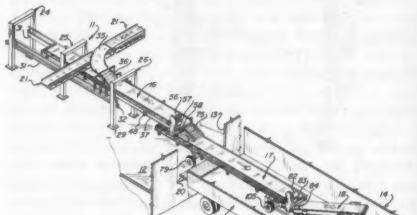
Filed Jan. 24, 1975, Ser. No. 543,726
Int. Cl.² B65G *65/02*
U.S. Cl. 214—1 P **5 Claims**

1. In a bar unscrambling and feeding apparatus of the type including a frame having longitudinally extending front and rear members spaced apart laterally and adapted to receive a bundle of unoriented bars, a plurality of flexible slings each having a front portion supported on said front member and a rear portion supported on said rear member and forming a festoon therebetween, said rear portion being at a higher position than the front portion, said slings being spaced apart longitudinally and adapted to support said bundle with the bundle extending in a generally longitudinal direction, transfer means adjacent the front member and adapted to transport a bar in a lateral direction from the front of the slings, reversible drive means for moving said slings to alternately shorten and lengthen the respective festoons and thereby raise and lower said bundle to orient said bars and feed a bar to the front of the slings, the improvement comprising: a front movable support means mounted on said front member with said front portion of the slings connected thereto, a rear movable support means mounted on said rear member with said rear portion of the slings connected thereto, said reversible drive means being connected with both of said movable support means for moving the front portion of the slings at a higher lineal speed than the rear portion of said slings whereby the slings tend to advance and retract the bundle toward and away from the transfer means when the festoons are alternately shortened and lengthened.

3,931,897
LOAD-OUT CONVEYOR APPARATUS

Duane D. Bacon, 6099 Brigadoon Drive, Longmont, Colo. 80501, and Edward J. Rutt, 2609 50th Ave., Greeley, Colo. 80631

Filed Aug. 19, 1974, Ser. No. 498,417
Int. Cl.² B65G *57/112*
U.S. Cl. 214—6 G **14 Claims**



1. In loading apparatus for stacking a plurality of articles from a storage area to a receiving area, the combination comprising:
a reference frame adapted to be positioned between the storage area and a selected distance from the receiving area;
conveyor means for moving articles delivered thereto over a selected distance, said conveyor means including a transfer section movable in and out of and guided by the frame and a discharge section in receiving relation to the transfer section and pivotally mounted at its intake end to swing up and down about a horizontal axis and to swing from side to side about a vertical axis to discharge articles

at a selected point in the receiving area, said transfer section including an upper conveyor supported for guided movement on said frame and a lower conveyor supported for guided movement by said frame and for movement under the upper conveyor in a stacked relation in a retracted position in the frame and an end-to-end relation in an extended position projecting beyond the end of the frame; and

a self-propelled vehicle including a rigid, unitary box-shaped vehicle frame movable on wheel means, said vehicle being movable relative to said reference frame, said vehicle being coupled to the transfer section and supporting the pivoted intake end of said discharge section and supporting said discharge section for moving said transfer section relative to said reference frame and positioning said discharge section in the receiving area, said vehicle having control means operable at the discharge end of said discharge section to regulate the direction, starting and stopping of said vehicle.

3,931,898

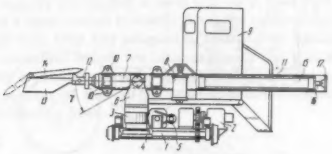
MACHINE FOR CONDITIONING ORE HEAT-TREATING FURNACE THROAT

Eduard Konstantinovich Karnobatsky, ulitsa Pobedy, 8b, kv. 26; Dmitry Grigorievich Linnik, Prospekt Lenina, 212, kv. 70, and Ivan Yakovlevich Stovbur, ulitsa Patrioticheskaya, 74, kv, 27, all of Zaporozhie, U.S.S.R.

Continuation of Ser. No. 435,017, Jan. 21, 1974, abandoned, which is a continuation of Ser. No. 323,400, Jan. 15, 1973, abandoned. This application Mar. 6, 1975, Ser. No. 555,721

Int. Cl.² F27B *3/18*

U.S. Cl. 214—32 **2 Claims**



1. A machine for conditioning an ore heat-treating furnace throat comprising: a self-propelled truck; a column; means mounting said column on said selfpropelled truck to be free to swing about a vertical axis; a tubular guide bar articulated to said column to be free to rotate about a horizontal axis; a hollow beam incorporated in said tubular guide bar; an actuating mechanism articulated on said hollow beam and constituting a scraper provided with two side edges and one front edge; a rod hinged on said front edge for movement about a horizontal axis; an air cylinder arranged in the interior of said beam and serving to transverse said actuating mechanism, said cylinder having a movable member and a stationary member; the cylinder movable member being articulated with said beam and the stationary member being articulated with said tubular guide bar.

3,931,899

BALE-HANDLING EQUIPMENT

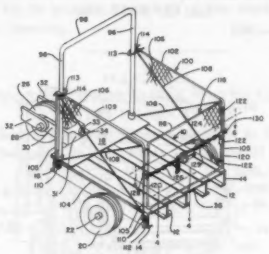
Norman E. McAlhaney, Rte. 3, Box 383, Orangeburg, S.C. 29115

Filed July 22, 1974, Ser. No. 490,242

Int. Cl.² B65G *67/02*

U.S. Cl. 214—38 CC **14 Claims**

1. A moble unit for the accumulation of items such as hay bales in the form of a stack for the removal of said items as a stack by an independent fork lift apparatus having tines, said unit comprising a platform including spaced stack-supporting members defining elongated gaps therebetween, said members being constructed and arranged to permit the insertion of said tines of said fork lift apparatus below said gaps and the movement of said tines therethrough, and said platform additionally including closure means mounted for movement between positions in which they close said gaps and positions in



which they expose said gaps for said movement of said tines therethrough and there is means for moving said closure means between said positions.

3,931,900

PEELER AND GRATER APPARATUS

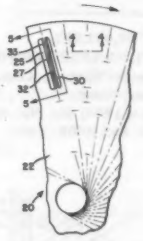
Gerard A. Tiby, Ivry-sur-Seine, France, assignor to Hobart Corporation, Troy, Ohio

Filed Dec. 18, 1972, Ser. No. 316,280

Claims priority, application France, Oct. 23, 1972, 72.37486

Int. Cl.² A47J *43/25*; **B02C** *18/18*

U.S. Cl. 241—296 **4 Claims**



1. A peeler and grater disc for a vegetable peeling machine comprising:

a. a rotatable disc,

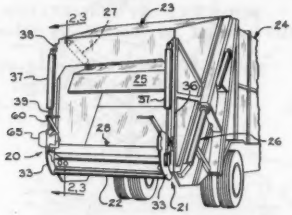
b. knife means formed from the surface of said disc and integral therewith, said knife means having at least one knife edge for cutting thin slices from the surfaces of vegetables moved thereagainst during rotation of said disc, and

c. lip means adjacent and slightly below the cutting edge of said knife means and formed from said disc and integral therewith to shield the knife means and limit the exposure thereof, to prevent excessive wear thereof, and to define the cutting depth of the knife means as the vegetables are moved thereagainst.

3,931,901
APPARATUS FOR DUMPING OPEN-TOPPED TRASH CONTAINERS

Norman E. Jones, Saratoga, Calif., assignor to Peabody Galion Corporation, Galion, Ohio

Filed Dec. 16, 1974, Ser. No. 532,909
Int. Cl.² B65F 3/02
U.S. Cl. 214—302 13 Claims



1. Apparatus for dumping an open-topped trash container having outwardly extending co-axial trunnions at its upper front corner, said apparatus comprising, in combination,

a. two laterally spaced mechanisms mounted on a structure which remains stationary while a container is being inverted therebetween for dumping, each of said mechanisms comprising

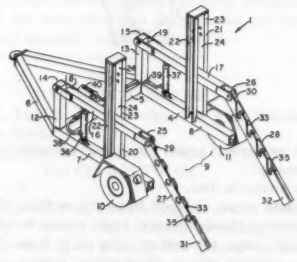
1. a main lever that is pivoted on said structure,
2. opposed co-acting trunnion lock members adapted to close around one of said trunnions,
3. lost motion connecting means between one of said trunnion lock members and said lever, and
4. an hydraulic cylinder and piston rod pivotally connected at its upper end to said structure and at its lower end to said one of said trunnion lock members and, through said lost motion connection, to said lever, and

b. a cross member extending between and connected to the lower ends of said levers and adopted to engage the container at a level below the trunnions when said levers are swung upwardly relative to said structure.

3,931,902
CABLE REEL TRANSPORT VEHICLE

Joseph W. Love, Jr., Bonner Springs, Kans., assignor to B. H. Mfg., Inc., Kansas City, Kans.

Filed July 24, 1974, Ser. No. 491,285
Int. Cl.² B60P 1/48
U.S. Cl. 214—390 9 Claims



1. A wheeled carrier for transporting reels and the like comprising:

a. a frame having a laterally extending main cross bar and a pair of laterally spaced beams secured to and extending rearwardly from said cross bar, said beams defining a rearwardly open space therebetween,

b. a pair of laterally spaced uprights secured to said beams near said cross bar and having upper ends projecting above said beams,

c. a pair of elongated arms respectively extending over said beams and having rear ends and forward ends, said forward ends being pivotally connected to said upright upper ends for arcuate movement of said arms in vertical planes,

d. a pair of elongated, rigid support bars respectively having upper ends hinged to said arm rear ends and lower ends, said support bars being movable from a lower position to an upper position in response to the arcuate movement of said arms, said support bars angling downwardly and rearwardly from said arm rear ends and being movably supported near said bar lower ends by said frame when said support bars are in said upper position,

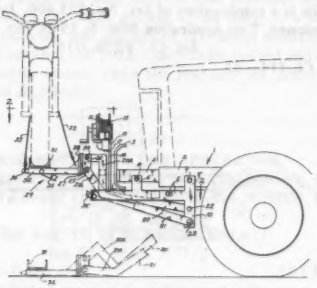
e. Means associated with said support bars to receive and support opposite ends of a cable reel axle shift, and

f. means selectively urging said arms through said arcuate movement.

3,931,903
MOTORCYCLE RACK FOR VEHICLES

McVoy Johnson, Star Rte. 2, Box 314, LaPine, Oreg. 97739

Filed May 3, 1974, Ser. No. 466,706
Int. Cl.² B60R 9/00
U.S. Cl. 214—450 3 Claims



1. A motorcycle rack for attachment to the frame members of a supporting vehicle in a load distributing manner, said rack comprising in combination,

a base frame including a pair of spaced parallel rails supported at fore and aft spaced apart points by the vehicle frame to impart loads to the frame at points therealong, said rails including upwardly directed projections for frame attachment purposes,

upper and lower pairs of arms located at each side of the base frame each of said arms pivotally mounted at its innermost end to said base frame below the vehicle frame and adapted for travel along a vertical path to constitute a parallelogram linkage, each upper and lower pair of arms at each side of the base frame terminating outwardly in pivotal attachment to a plate member with a transverse face,

a motorcycle support structure located forwardly adjacent a vehicle bumper in its raised travel position and including elongate means for the reception of motorcycle wheels,

means for imparting a lifting force to the motorcycle support structure, and

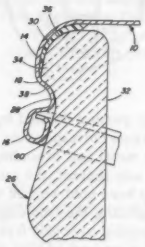
said motorcycle support structure including a pair of transverse plate members each in juxtaposition with the first mentioned plate members, means readily detachably mounting the plate members of the motorcycle support structure to the first mentioned plate members whereby said motorcycle support structure may be easily attached to and detached from said first mentioned plate members.

such that when the rack is not being used to support a motorcycle, the resulting combined length of the vehicle and motorcycle rack with the motorcycle support structure removed, is only slightly greater than the vehicle length alone.

3,931,904
TEAR-OFF CLOSURE

Jackie Allen Coop, P.O. Box 94, New Lisbon, Ind. 47366

Filed Dec. 11, 1974, Ser. No. 531,627
Int. Cl.² B65D *41/42*
U.S. Cl. 215—254 14 Claims

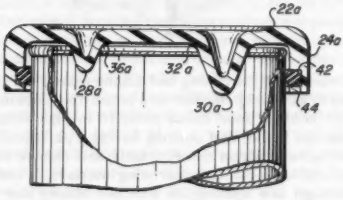


1. A sheet metal closure adapted to be secured on a container and comprising a top panel, a depending skirt around the periphery of the top panel with a pair of weakening lines in the skirt defining a tear strip across the skirt, and a substantially rigid pull ring disposed generally beneath the bottom edge of said skirt substantially concentric with the skirt and integrally connected to said tear strip, said pull ring comprising a bead curled inwardly from the connection of the ring to said tear strip and adapted to be cammed against the neck of a container below the connection to the tear strip when the ring is lifted to partially wrap the end of said tear strip around a portion of the curled bead and initiate severance of said weakening lines.

3,931,905
BEVERAGE CONTAINER OPENER AND SEALING DEVICE

Roger R. Shumway, and Donald C. Bortel, both of Glendale, Ariz., assignors to Donald C. Bortel, Glendale, Ariz.

Filed Dec. 16, 1974, Ser. No. 532,780
Int. Cl.² B65D *41/02*
U.S. Cl. 220—278 3 Claims



1. A device for opening containers of the type having a lid with weakened closure portions therein adapted to be inwardly depressed, said device comprising:

a. a generally circular body member adapted to extend across the lid of the container having an inner planar surface;

b. a peripheral lip depending from said body member;

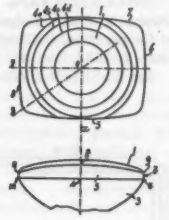
c. projection means depending from the inner surface of said body member arranged to align with said weakened closure points in the container lid, said projection means having a general V-shaped cross section extending uniformly from said inner surface;

d. whereby the device may be snugly engaged with the container with the projection means in alignment with the weakened closure portions and whereby said device can be manually depressed to open said closure portions to bring said planar surface proximate or in contact with said lid to prevent spraying of the container contents upon opening.

3,931,906
BULBS FOR CATHODE TUBES, PARTICULARLY FOR TELEVISION TUBES

Georges Bradu, Nemours, France, assignor to Societe des Verreries Industrielles Reunies du Loing, Paris, France

Filed Feb. 24, 1966, Ser. No. 529,747
Claims priority, application France, Mar. 4, 1965, 65.7895
Int. Cl.² B29C *23/00*
U.S. Cl. 425—505 3 Claims

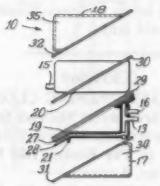


1. A bulb for a cathode tube comprising a cone having a narrow end and a wide substantially rectangular base end, a screen having a curved viewing portion having a substantially rectangular peripheral contour complementary to the contour of the base end of said cone, said viewing portion being so curved that sections therethrough parallel to said base cone end define curves which are substantially parallel to said cone base end contour, and means securing together said cone base end and said screen at their respective edges.

3,931,907
COMBINATION WATER SUPPLY AND WASTE HOLDING TANK

George A. Henle, 920 Penfield St., Beecher, Ill. 60401

Filed Jan. 15, 1975, Ser. No. 541,225
Int. Cl.² B65D *87/16*, *25/04*
U.S. Cl. 220—22 14 Claims



1. A combination fresh water supply and liquid waste holding tank for use in mobile vehicles, comprising:

a bottom half shell defined by a bottom wall, an upright end wall at one end of the bottom wall, and opposed side walls extending downwardly from the top of said end wall to the opposite end of the bottom wall;

an upper half shell defined by a top wall, a depending end wall at one end of the top wall, and opposed side walls

extending upwardly from the bottom of said end wall to the opposite end of the top wall;

means for securing said half shells together with the lower edge of the upper half shell side walls juxtaposed to the upper edge of the lower half shell side walls to define a parallelepiped shell;

an extensible divider wall sealingly secured between said half shells and being extensible selectively fully upwardly into said upper half shell and fully downwardly into said lower half shell;

first flexible holding means for holding fresh water disposed within the shell above said divider wall;

second flexible holding means for holding waste disposed within the shell below said divider wall;

first port means for passing fresh water through said shell into and from said first flexible holding means; and

second port means for passing waste through said shell into and from said second flexible holding means.

3,931,908

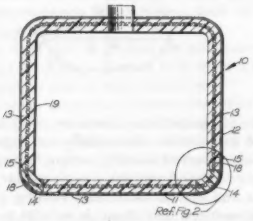
INSULATED TANK

Dan R. Cheyney, Piedmont, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Aug. 2, 1973, Ser. No. 386,459

Int. Cl.² B65D *25/18*

U.S. Cl. 220—71 **5 Claims**



1. In a metallic tank capable of storing or transporting large volumes of liquid at temperatures from about −70° to −400°F., said tank having a generally rectilinear cross section, wherein the internal surface of said tank is lined with a foamed insulation on at least the upstanding walls and the floor thereof, an improved corner joint construction between the wall insulation and the floor insulation comprising a layer of foam in the corner, abutting the wall insulation and the floor insulation and having a density of at least one pound per cubic foot greater than the wall and floor foam insulation and having incorporated in said denser foam an interlayer consisting of flexible webbing of generally retiform construction, said flexible webbing extending beyond said denser foam and incorporated into the abutting layers of lower-density foam affixed to the wall and floor of said tank.

3,931,909

PUSH-IN EASY-OPENING CLOSURES

Alan George Dalli, Warrandyte; Michael Debenham, Frankston, and Ralph Edward Shackleford, Ferntree Gully, all of Australia, assignors to The Broken Hill Proprietary Company, Ltd., Melbourne, Australia

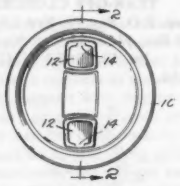
Division of Ser. No. 180,785, Sept. 15, 1971, Pat. No. 3,759,206. This application June 29, 1973, Ser. No. 375,066

Claims priority, application Australia, Sept. 16, 1970, 2556/70

Int. Cl.² B65D *41/32*

U.S. Cl. 220—268 **26 Claims**

1. A push-in easy-opening closure in a sheet metal container member for use in a container suitable for containing carbonated beverages, comprising an opening in the container member, said opening at least partially defined by a free edge of metal having a thickness substantially corresponding to the entire thickness of the sheet metal and extending from one side of the metal to the other side thereof and surrounded by a marginal portion radially outward thereof, and an integral closure member for said opening, said closure member severed from said container member around a substantial portion of the periphery of the closure member and having a central



portion and a free edge portion defined by the line of severance and having a thickness corresponding to substantially the thickness of said sheet metal and extending from one side of the metal to the other side thereof, the said marginal portion of said free edge having been cold worked to decrease the size of said opening by displacing the free edge radially inwardly into overlapping relationship over said free edge portion, said marginal portion being more worked than said central portion.

3,931,910

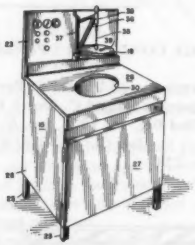
CLOSURE LID FOR CLOSING THE OPENING OF A FOOD COOKING RECEPTACLE

Charles Jere Albright, Chicago; Clifford E. Fitch, Sr., and Clifford E. Fitch, Jr., both of Chicago Heights, all of Ill., assignors to Chemetron Corporation, Chicago, Ill.

Division of Ser. No. 184,892, Sept. 29, 1971, Pat. No. 3,778,524, which is a continuation-in-part of Ser. No. 793,392, Jan. 23, 1969, abandoned. This application June 7, 1973, Ser. No. 367,724

Int. Cl.² A47J *36/06, 36/10, 36/12*

U.S. Cl. 220—329 **7 Claims**



1. A closure lid for closing and sealing against the rim of an opening to a cooking chamber of a pressurized cooking receptacle for cooking food under pressure in high temperature non-aqueous liquid, said opening having a peripheral sealing rim therearound within the receptacle, said closure lid having a peripheral sealing surface and being insertable in and removable through said opening for selective closing and opening relationship relative thereto, a support mounted to the receptacle, a swingable bracket means mounted to the support for swinging movement relative to the receptacle, a closure lid support arm, means pivotally mounting the support arm to the bracket means for swinging movement of the arm with the bracket means and for pivotal movement of the arm relative to the bracket means, said closure lid carried by the support arm for movement with the support arm, and resilient means connected with the support arm for urging the support arm upwardly and thus urging the closure lid upwardly against the sealing rim into operative position until pressure in the recep-

tacle increases to an amount sufficient to urge the closure lid into tight, sealing relationship relative to the rim, and said resilient means resiliently biasing the support arm and closure lid up and away from the opening when the closure lid is removed therethrough.

3,931,911

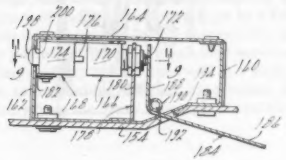
ICE DISPENSING MACHINE

Vance L. Kohl, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 205,215, Dec. 6, 1971, Pat. No. 3,796,351. This application Dec. 17, 1973, Ser. No. 425,103

Int. Cl.² B67D 5/14

U.S. Cl. 222—56 7 Claims



1. In an apparatus for storing and dispensing ice in particulate form that is produced by an associated ice making machine, a generally cylindrical particulate ice storage compartment, a bottom closure for said compartment and means defining a discharge opening in said closure, means for moving ice within said compartments towards said opening, an electrical control circuit communicating a source of electrical energy with said ice making machine, a first switch connected to said circuit and having a switch body and an actuator, said actuator normally being disposed in a first position closing said circuit and movable relative to said body to a second position opening said circuit, a second switch normally disposed directly adjacent said first switch and connected to said circuit, said second switch having an actuator normally disposed in a first position closing said circuit and movable to a second position opening said circuit solely under the influence of said first switch body moving from said normal position to an actuated position, an ice engaging element pivotably mounted adjacent the upper end of said compartment and having a portion engageable with ice in said compartment and adapted to apply a force of a predetermined magnitude upon engagement of said ice therewith, a yieldable support member supporting said first switch at said normal position adjacent said second switch and permitting movement of said first switch from said normal position to said actuated position under the application of said force from said ice engaging element against said first switch actuator and under conditions when said first switch actuator is predeterminately inoperative, whereby when said predetermined inoperative condition exists and said element is engaged by ice within said container, said second switch actuator will be moved by said first switch to said second position opening said circuit to prevent operation of said ice making machine, and wherein said first switch is operatively supported by said body upon said yieldable support which comprises a relatively resilient member permitting movement of said first switch body toward and into engagement with said actuator of said second switch under the influence of said force being exerted against said first switch.

3,931,912

TWO-PART HAIR DYE OR HAIR BLEACH PACKAGE

Du Yung Hsiung, Park Forest, Ill., assignor to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 171,398, Aug. 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 846,580, July 31, 1969, abandoned. This application Oct. 7, 1974, Ser. No. 512,844

Int. Cl.² B65D 35/22

U.S. Cl. 222—94 17 Claims

1. A dispensing container having two compartments providing separate storage of two parts of a hair treating composition selected from the group consisting of aqueous hydrogen peroxide hair bleach and aqueous oxidative hair dye compositions and means including a pressure propellant for dispensing the contents of both compartments simultaneously with mixing thereof, the contents of one compartment comprising an aqueous medium containing an alkalizing agent sufficient to provide a pH from 7.0 to 12 in the mixed composition and a control compound which is a member of the group consisting of o-aminophenol, p-aminophenol, methyl-p-aminophenol, 4-amino-3-methylphenol, 2,4-diaminophenol, N-(p-hydroxyphenyl) glycine, p-phenylenediamine, p-tolylenediamine, 1,2,4,5-tetrahydroxybenzene, betanaphthol, 2,5-dihydroxybenzoic acid, 3,4 -dihydroxybenzoic acid, gallic acid, propyl gallate, 2,7-naphthalenediol, 2,2',4,4'-tetrahydroxybiphenyl, hydroquinone monosulfonic acid, 3,4,5-trihydroxyacetophenone, 3-(N,N,-dimethylamino) phenol, 8-hydroxyquinoline, pyrocatechol, resorcinol, hydroquinone, pyrogallol, 1,3,5-trihydroxybenzene, 4-t-butyl catechol, 1,5-naphthalenediol, 3-hydroxydiphenylamine, m-phenylene diamine, 2,4-diaminoanisol, and mixtures thereof, and the contents of the other compartment comprising an aqueous hydrogen peroxide solution, the amount of hydrogen peroxide being from 0.1 to 6% by weight of the total contents of the container excluding pressure propellant, the amount of total control compound being from 10 to 500% by weight of the hydrogen peroxide and sufficient to prevent liberation of oxygen gas in an amount to produce total pressure in the package greater than 150 p.s.i.g. if mixing of the two parts within the package occurs.

3,931,913

SLIDE GATE NOZZLE

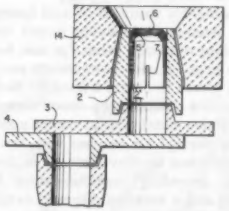
Ernst Meier, Adliswil, Zurich, Switzerland, assignor to Stopinc Aktiengesellschaft, Zug, Switzerland

Filed Nov. 18, 1974, Ser. No. 524,944

Claims priority, application United Kingdom, Nov. 16, 1973, 53356/73

Int. Cl.² B22D 37/00, 41/08

U.S. Cl. 222—146 C 7 Claims



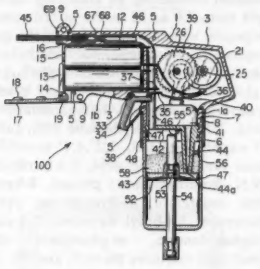
1. A slide gate nozzle for the spout of a metallurgical vessel said slide gate nozzle comprising:

a pair of plates arranged on the opening of a pouring channel of said spout, said pair of plates including a fixed bottom plate and a displaceable sliding plate; and

a metal element positioned in said pouring channel of said spout, said element closing the cross section of said channel, said metal element, on the side thereof turned toward the interior of said vessel, being provided with an insulat-

ing layer of refractory material, the other side of said metal element being free for radiation of heat.

3,931,914
POWDER EJECTOR
Hideo Hosaka, Takasaki, and Yasuo Kawamata, Gunma, both of Japan, assignors to Max Kabushiki Kaisha, Tokyo, Japan
Filed June 3, 1974, Ser. No. 475,836
Claims priority, application Japan, July 13, 1973, 48-83203[U]; July 13, 1973, 48-83202[U]; July 13, 1973, 48-83201[U]; July 11, 1973, 48-82811[U]; July 11, 1973, 48-83810[U]; July 10, 1973, 48-81705[U]; July 10, 1973, 48-81707[U]; July 10, 1973, 48-81706[U]; July 11, 1973, 48-82809[U]; July 11, 1973, 48-82808[U]
Int. Cl.² B67D *5/54*
U.S. Cl. 222—193 **9 Claims**



1. In a portable hand-held powder dispensing device, comprising in combination:

portable housing means defining therein a substantially closed equipment chamber and a battery containment space, said housing means having an opening formed therein for communication with said space;

a powder storage container fixedly attached to said housing means and defining therein a compartment adapted to contain a quantity of powder;

pump means mounted on said housing means and positioned within said chamber for supplying air into said compartment, said pump means having a discharge port connected so as to communicate with said compartment;

electrical motor means for driving said pump means, said motor means being mounted on said housing means and disposed within said chamber;

battery means disposed within said space for energizing said motor means;

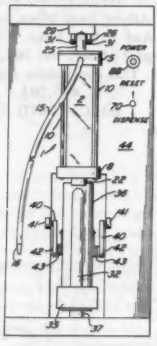
cover means swingably mounted on said housing means for closing said opening, said cover means being hingedly connected along one edge thereof to said housing means, the opposite edge of said cover means cooperating with said housing means to create a pressure fit therebetween when in a closed position, the cover means also having electroconductive metal contact means positioned on the inner surface thereof for contact with terminals on the battery means when the cover means is closed;

conduit means providing communication between said compartment and a location disposed externally thereof for permitting discharge of powder from said compartment, said conduit means having the inlet end thereof positioned in communication with said compartment and having a discharge member on the outlet end thereof;

electrical switch means mounted on said housing means for electrically connecting said battery means and said motor means together to permit energization of said motor means when said switch means is closed; and

manually actuated means movably supported on said housing means and coacting with said switch means for permitting selected actuation of said switch means.

3,931,915
LIQUID-CONTAINING CARTRIDGE AND A DEVICE FOR DISPENSING MEASURED AMOUNT OF LIQUID FROM SUCH A CARTRIDGE
Harvey T. Downings, and Byron E. Sturgis, both of Huntsville, Ala., assignors to Micromedic Systems, Inc., Horsham, Pa.
Filed Oct. 10, 1973, Ser. No. 405,226
Int. Cl.² G01F *11/02*
U.S. Cl. 222—327 **17 Claims**



13. A device for dispensing a liquid in one or more aliquots of measured amount from a package unit having a liquid-containing tube, a port at one end of the tube in communication with the liquid in the tube, a piston within the tube, said piston having a forward wall, a back wall, and an outer cylindrical surface provided with an annular sealing means and fitting slidably within the inside wall of the tube whereby the piston is movable axially back and forth within the tube to force liquid within the tube through the port, and access means adapted to receive a ramrod in engagement with the back wall of the piston, said device comprising:

a. a ramrod having a retracted position and an advanced position,

b. means for releasably mounting the package unit with its access means in alignment with the ramrod in retracted position,

c. means for incrementally advancing the ramrod lengthwise against the back wall of the piston, and thereby pushing the piston axially ahead of it in one or more increments toward said advanced position, comprising:

1. a rotatable screw shaft mounted with its axis offset from and parallel to the ramrod,

2. means comprising a reversible motor for rotating the screw shaft on its axis,

3. means for interrupting rotation of the screw shaft at a predetermined angular position at the end of each revolution of the screw shaft whereby the size of each aliquot for a given piston depends on the pitch of the screw, and

4. means for reversing the motor to move the ramrod to retracted position.

3,931,916
DISPENSING-TYPE BOX
Maurice R. Blue, South Bend, and Glen Younker, Dyer, both of Ind., assignors to Slip-Not Corporation, Dyer, Ind.
Filed Aug. 15, 1974, Ser. No. 497,825
Int. Cl.² B65D *5/46*
U.S. Cl. 222—465 **1 Claim**

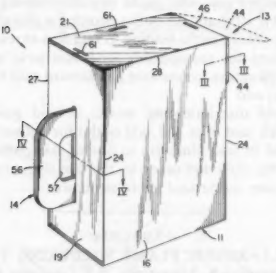
1. A dispensing-type receptacle, comprising:

wall means defining a substantially closed box having a substantially closed compartment in the interior thereof adapted for the storing of a particle material;

said wall means including (1) a pair of opposed and substantially parallel sidewalls, (2) opposed and substantially parallel front and rear walls extending between and connected to the edges of said sidewalls for defining a tubular member of substantially rectangular cross section, said rear wall having a vertically elongated slot formed centrally thereof, and (3) opposed and substantially parallel top and bottom walls extending between the upper and lower edges, respectively, of said tubular member for closing the upper and lower ends thereof;

dispensing means associated with said front wall for permitting the material within said compartment to be poured from said box, said dispensing means including a plurality of preformed openings within said front wall adjacent the upper end thereof, said openings being disposed within at least two horizontally extending rows which are spaced one above the other, each row containing therein a plurality of openings with the openings in one row being horizontally staggered relative to the openings in the other row;

said dispensing means also including a closing flap fixedly but releasably coupled to said front wall for overlying said openings, said closing flap being integrally connected to said top wall and separated therefrom by a fold line which permits said flap to be folded downwardly to overlie the upper portion of said front wall, and securing means for securing said flap to said front wall at a location disposed below said openings, said securing means being spaced upwardly from the lower free edge of said flap so that the lower edge portion of said flap is free of connection to said front wall; and



handle means associated with said rear wall for permitting gripping of said receptacle, said handle means comprising a separate sheetlike member positioned within the interior of said box and disposed so as to overlie said rear wall, said sheetlike member having a center portion of rectangular size substantially similar to said rear wall, said sheetlike member also having a pair of rectangular end portions integrally connected to the opposite ends of said center portion, said end portions having a width substantially one-half the width of said center portion and being hingedly connected to said center portion so that said end portions are folded inwardly to overlap said center portion to form a double thickness;

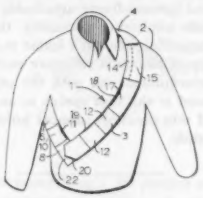
said handle means further including a substantially C-shaped loop integrally but hingedly connected to the free edge of each of said end portions and extending substantially perpendicular thereto whereby the C-shaped loops as connected to said end portions are disposed directly adjacent one another in side-by-side relationship and form a C-shaped handle which projects outwardly through said slot so as to be accessible from the exterior of said box, each of said C-shaped loops being foldable downwardly away from one another so as to overlie the exterior surface of said rear wall in substantially parallel relationship therewith, and said end portions of said sheetlike member being abuttingly engaged with and fixedly secured to the inner surface of said rear wall.

3,931,917

PERSONAL MATERIALS CARRIER

Donal R. Zellmer, USA Aero Services DETE, APO New York, N.Y.

Filed Mar. 12, 1973, Ser. No. 340,394
Int. Cl.² A45F *5/00*; F42B *39/02*
U.S. Cl. 224—5 R **10 Claims**



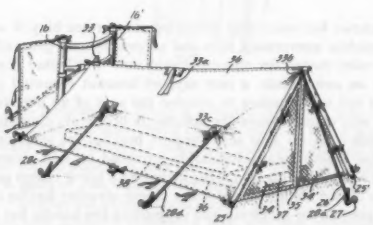
1. Shoulder-mounted personal materials carrier apparatus comprising a curved band for positioning on a body of a wearer, the carrier band having a diagonal chest-overlying portion for extending from a lateral waist area to a position adjacent an opposite shoulder area, a shoulder-overlying portion connected to an upper end of the diagonal chest-overlying portion, the shoulder-overlying portion being configured for lying flat upon a shoulder, and wherein the shoulder-overlying portion and the chest-overlying portion are connected at obtuse angles to make the carrier band lie flat against the body, a back portion connected to the shoulder-overlying portion remote from the diagonal chest-overlying portion and extended downward, a partial waist-encircling portion connected to the back portion remote from the shoulder-overlying portion and extended forward to a lateral waist area, where the partial waist-encircling portion is connected to a lower end of the diagonal chest-overlying portion at a generally perpendicular angle, and a plurality of varied pockets in the carrier band, the pockets having openings in varied directions.

3,931,918

CONVERTIBLE PACK FRAME WITH COMPRESSOR FLAPS FOR SUPPORTING A TENT IN DIFFERENT MODES

George N. Smith, Deerhaven Road, Bedminister, N.J. 07921, and John J. Marshall, 5 W. Riding Drive, Bel Air, Md. 21014

Filed Feb. 2, 1972, Ser. No. 222,918
Int. Cl.² A45F *4/04*
U.S. Cl. 224—10 **20 Claims**



1. A pack comprising in combination: container means for retaining articles during transport thereof by harness attachment during enclosure in association with a folded tent by a compressor; a collapsible portable tent means for intermittent attachment in a folded state in association with the container

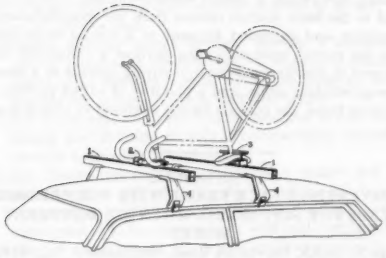
means during compressor enclosure, by a harness attachment; flap compressor means for intermittent at-least partially enclosing and releasably securing together said container means and said tent means by harness attachment during transport thereof while enclosed by a compressor thereof; harness means for attachably harnessing together and during a harnessed state transporting said container means, said tent means in a collapsed folded state, and said compressor means in a state of enclosing the container means and the tent means; and a pack frame means for mounting of the harness means during said transporting, said pack frame means including transportable and harness-frame-attachable substantially rigid support elements anchoring securably the harness means during said transporting, the pack frame means including as a part of said support elements structure such that the support elements are coordinated one with the other in association with and mounted in the tent means in an unfolded state to result in a rigid tent-erection support holding the tent in an erected raised state.

3,931,919

BICYCLE CARRIER FOR AUTOMOBILES

Gary A. Gerber, 15 White Birch Ridge, Weston, Conn. 06880, and Kenneth R. Benson, 80 University Ave., Bridgeport, Conn. 06604

Filed Mar. 12, 1974, Ser. No. 450,363
Int. Cl.² B60R 9/10
U.S. Cl. 224—42.1 F **7 Claims**



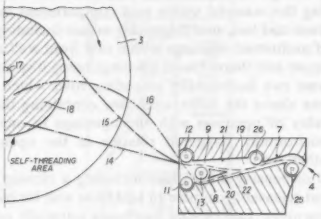
1. A carrier for removably mounting at least one bicycle on an automobile comprising first and second spaced generally parallel rails, means for mounting said rails in selected positions on an automobile, a seat support bracket mounted on said first rail in a position to receive the seat of an inverted bicycle, seat clamp means for selectively positively clamping the bicycle seat on said seat support bracket, at least one handle bar clamp means adjustably mounted on said second rail, said handle bar clamp means including a lower clamp and an upper clamp member, said lower clamp member having an arcuate portion for receiving and supporting the handle bar of the bicycle, means for securing said lower clamp member in fixed adjusted position, said upper clamp member having a portion adapted to overlie the bicycle handle bar, and means for removably securing said upper clamp member in fixed position overlying the handle bar when the bicycle is in position, whereby the bicycle seat and handle bars are removably clamped to said first and second rails.

3,931,920

STRIP-GUIDING STRUCTURE FOR RECORDING OR REPRODUCING APPARATUS

Otto Hellinger, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Mar. 21, 1974, Ser. No. 453,298
Claims priority, application Austria, Apr. 6, 1973, 3023/73
Int. Cl.² G03B 1/56
U.S. Cl. 226—91 **4 Claims**



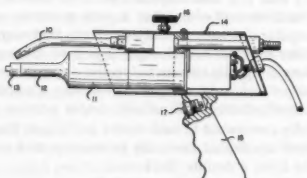
1. In motion-picture equipment, in combination:
a take-up reel provided with film-threading means for engaging the leading end of an oncoming film strip of indeterminate initial curvature;
a guide structure for directing said film strip regardless of its curvature toward said film-threading means across an intervening gap, said guide structure having an inlet for said film strip and an outlet forming a plurality of differently oriented paths leading to said film-threading means;
feed means for transporting said film strip through said guide structure across said gap toward said filmthreading means; and
directional discriminating means in said guide structure between said inlet and said outlet for delivering the leading end of said film strip to one of said paths, depending upon the direction taken by the film strip according to its curvature inside said guide structure.

3,931,921

ULTRASONIC FLAME SOLDERING TOOL

John N. Antonevich, Jamestown, N.Y., assignor to Blackstone Corporation, Jamestown, N.Y.

Filed Sept. 27, 1974, Ser. No. 509,948
Int. Cl.² B23K 1/06
U.S. Cl. 228—1 **6 Claims**



1. An ultrasonic flame soldering tool comprising, a flame heat source means, and transducer means, spaced from the heat source means and connected thereto, said transducer means having tip means fixably attached thereto and extending forward of said flame heat source means and generally outside said flame source means to contact a work piece being soldered whereby the work piece is separately heated and subject to ultrasonic vibrations at solder temperature to cause

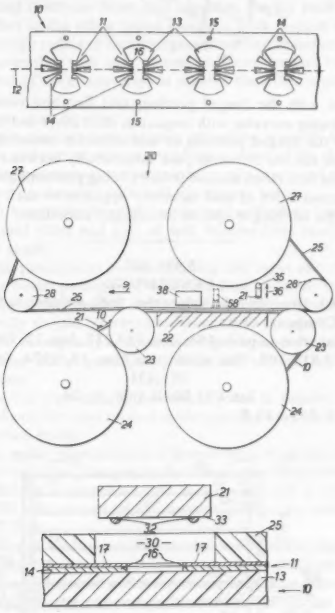
molten solder on the work piece to wet and adhere to work piece.

3,931,922

APPARATUS FOR MOUNTING SEMICONDUCTOR DEVICES

Sydney Jackson, Hayfield, and Alan Arthur Shepherd, Bramhall, both of England, assignors to Ferranti, Limited, Hollinwood, England

Continuation-in-part of Ser. No. 307,374, Nov. 17, 1972. This application Jan. 29, 1973, Ser. No. 327,638
Claims priority, application United Kingdom, Jan. 29, 1972, 4259/72; Aug. 30, 1972, 40169/72
Int. Cl.[2] H01L 21/58
U.S. Cl. 228—6 30 Claims



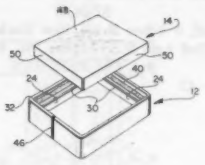
1. Apparatus for mounting semiconductor devices each of which are rectangular-shaped in plan and having contacts thereon comprising a continuous strip including a plurality of lead frames, the lead frames being uniformly spaced along the longitudinal axis of the strip, each lead frame having a matrix of conductors, the end portions of which are adapted for connection to contacts of a corresponding semiconductor device, a masking member defining at least one rectangular-shaped aperture for accurately locating a semiconductor device, means for feeding the lead frame strip and masking member longitudinally between a first and a second station with the aperture defined in the masking member being in a desired registration on a lead frame of the lead frame strip such that the conductor end portions of that lead frame are exposed through the aperture, means at one of said stations for precisely positioning the lead frame and the masking member with respect to each other such that when a corresponding semiconductor device is inserted in the required orientation into the aperture each device contact is exclusively opposite to a co-operating conductor end portion, and bonding means disposed between said first and said second station and adjacent the paths of travel of said lead frame strip and masking member for bonding the device contacts to the cooperating conductor end portions.

3,931,923

BOX SECTION COVER MEMBER

Benjamin L. Thurston, 783 Great Road, Lincoln, R.I. 02865

Filed Jan. 21, 1975, Ser. No. 542,855
Int. Cl.[2] B65D 13/04
U.S. Cl. 229—23 R 10 Claims



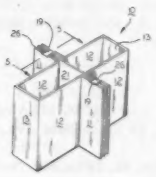
1. A box section comprising a rim portion constructed of an elongated flat strip having its ends in abutting relation, said strip being formed to assume the desired configuration of the box section and defining the side walls thereof, said strip having flange means reversely bent along a longitudinal edge thereof, said flange means abutting the inner surface of said rim portion and terminating in spaced relation to the opposite longitudinal strip edge so as to define a shoulder on said inner side wall surface, and a separate cover member comprising a wall having the same configuration as that defined by said rim portion, said wall having a marginal flange extending into said rim portion from said opposite edge and being snugly received therein, the free edge of said marginal flange abutting against said shoulder, the depth of said marginal flange being substantially equal to the spacing between said shoulder and said opposite edge, whereby said wall is located adjacent said opposite edge and closes the adjacent end of said rim portion, and means securing said cover member to said rim portion.

3,931,924

ERECTABLE PARTITION

Jeffrey M. Gardner, Wheaton, Ill., and William M. Pilz, III, Eldridge, Iowa, assignors to Container Corporation of America, Chicago, Ill.

Filed Oct. 9, 1974, Ser. No. 513,459
Int. Cl.[2] B65D 5/48
U.S. Cl. 229—28 R 3 Claims



1. A partition for dividing a walled container into compartments, said partition being characterized by being stable both within and without the container and being formed from cut and scored paperboard or the like, said partition comprising;

a. pairs of end, side and confronting panel elements foldably connected along parallel score lines;

b. said foldably connected end, side and confronting elements defining two sets of parallel and spaced side panel elements, two sets of coplanar confronting panel elements and two end panel elements, each of said panel elements being parallel to said coplanar confronting panel elements and spaced therefrom and also connected to two of said confronting panel elements by two of said side panel elements;

c. hinge means connecting each set of confronting panel elements;

d. a separating panel element foldably connected to one of said confronting panel elements and positioned between each set of confronting panel elements.

3,931,925

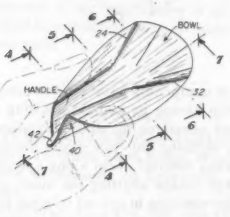
PAPERBOARD CONTAINER LID CONVERTIBLE INTO A SPOON

Stanley L. Ruff, 9 Arbor Drive, New Rochelle, N.Y. 10804

Filed Apr. 5, 1974, Ser. No. 458,317

Int. Cl.² B65D *3/16*

U.S. Cl. 229—43 **3 Claims**



1. For an open-top food container, a flat lid formed to cooperate with the container as a detachable closure therefor, said lid comprising: a flat panel the periphery of which is shaped to cooperate with the container so as to form a detachable cover therefor, said flat panel having formed therein a plurality of weakened zones so arranged with respect to one another and the panel that the panel is convertible by folding about said zones into a spoon having a handle portion and a bowl portion joined at a throat, the so-formed handle constituting a pleated arrangement extending diametrically of the panel from a perimeter of the panel to the throat of the spoon, and the so-formed bowl constituting a scoop-shaped portion extending from the handle at the throat to the opposite perimeter of the panel, the weakened zones in the handle portion including three zones substantially parallel to one another with the intermediate zone lying substantially on a diameter of the panel, the remaining two zones being outer zones, and the weakened zones of the bowl portion including two outer zones extending away from the inner ends of the outer zones of the handle portion and flaring away from one another, and at least one intermediate zone, the portions of the panel outwardly of the outer zones in the so-formed spoon constituting downwardly extending lips.

3,931,926

LATCHING MEANS

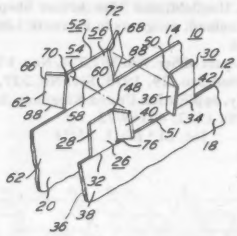
Richard E. Bensen, 18 Springfield Ave., Apt. 3G, Cranford, N.J. 07016

Filed Apr. 18, 1974, Ser. No. 461,961

Int. Cl.² B65D *45/00*

U.S. Cl. 229—45 R **29 Claims**

1. A latching means for securing together a pair of members comprising a first member and a second member, said first member having a first pair of elements extending substantially along the plane of the first member while said second member has a second pair of elements extending substantially along the plane of the second member, each of said elements having first and second sides, each of said first elements being positionable with its first side opposite to the first side of a respective one of said second elements for assuming its disengaged condition and alternatively with its second side opposite to the second side of its respective second element to assume its engaged condition, said first elements being spaced apart and extending in the directions toward each other while the second elements extend in the directions away from each other, at least one of said first elements having a hinged portion movable about an axis substantially perpendicular to said extending directions of said first elements while at least one of said second elements has a hinged portion movable about an axis substantially parallel to the axis of the hinged portion of said first elements which is positioned opposite to said first



element with the hinged portion, said first and second elements being movable with respect to each other and by actuation of the hinged portions of said elements about their said axes the second elements pass substantially between and beyond the first elements and thereby being positionable to have the second sides of said elements opposite to each other to place the latching means in its engaged condition.

3,931,927

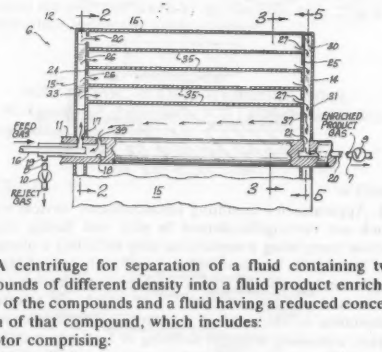
CENTRIFUGE

Robert J. Hengstebeck, Valparaiso, Ind., assignor to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 323,212, Jan. 12, 1973, Pat. No. 3,814,307. This application Mar. 15, 1974, Ser. No. 451,431

Int. Cl.² B04B *5/08, 11/06*

U.S. Cl. 233—19 R **23 Claims**



1. A centrifuge for separation of a fluid containing two compounds of different density into a fluid product enriched in one of the compounds and a fluid having a reduced concentration of that compound, which includes:

a rotor comprising:

a rotor shaft;

a rotor housing to enclose an elongated intermediate portion of said shaft so as to provide around said intermediate portion of said shaft an elongated working space of annular cross section;

a set of partition wall means in said working space of said housing, and concentric with and extending generally parallel to the longitudinal axis of said shaft from one end part of said intermediate portion to the other end part of said intermediate portion providing a number of elongated annular chambers about said axis for major flow of fluid in said working space across a centrifugal force field and generally parallel to said axis;

distributor means extending radially outward from said shaft within one end part of said housing and having concentric sets of openings at different bands of radial

distances from said axis to furnish feed fluid separately to said chambers;

first collector means extending radially outward from said shaft within the other end part of said housing and having concentric sets of openings at different bands of radial distances from said axis that are for each band offset in one radial direction with respect to the average radius of that elongated annular chamber communicating with said first collector means by that band of set of openings to receive one of the separated fluids; and

second collector means located at said other end part of said housing or between said end parts of said housing but adjacent said other end part of said housing and having concentric sets of openings at different bands of radial distances from said axis that are for each band offset in the other radial direction with respect to the average radius of that elongated annular chamber communicating with said second collector means by that band of set of openings to receive the other separated fluid,

said rotor shaft having:

a longitudinal inlet passageway extending inwardly to said one end part of said intermediate portion of the shaft;

a radial passageway communicating said inner end of said inlet passageway with said distributor means;

a first longitudinal outlet passageway extending inwardly to said other end part of said intermediate portion of the shaft;

a radial passageway communicating said inner end of said first outlet passageway with said first collector means;

a second longitudinal outlet passageway extending inwardly to said intermediate portion of the shaft; and

a radial passageway communicating said inner end of said second outlet passageway with said second collector means;

a first outlet pipe connected to said rotor to receive from one of said first and second outlet passageways one of the separated fluids;

a second outlet pipe connected to said rotor to receive from the other outlet passageway the other separated fluid; and

valved means mounted on said first outlet pipe to control the rate of removal of the separated fluid by said first outlet pipe,

the total area of said openings at each band of radial distance from said axis for one of said distributor means for feed fluid and said first and second collector means to receive separated fluids being proportional to a value between about the third power and about the fourth power of the average radius of the elongated annular chamber with which the set of openings is in alignment.

3,931,928

APPARATUS FOR SEPARATING A MIXED LIQUID CONTAINING COMPONENTS OF DIFFERENT SPECIFIC GRAVITIES

Jitsuo Kido, 6-23, 1 chome Kiyota-cho, Yahata, Kitakyushu, Fukuoka, Japan

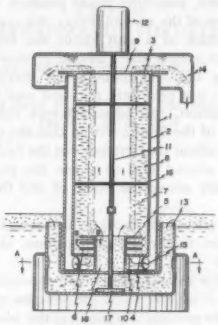
Filed Jan. 16, 1974, Ser. No. 433,896

Claims priority, application Japan, Jan. 20, 1973, 48-9027; Jan. 23, 1973, 48-10128; Feb. 9, 1973, 48-16269; Mar. 28, 1973, 48-35371; June 12, 1973, 48-66006; Aug. 13, 1973, 48-90757; Sept. 10, 1973, 48-101856

Int. Cl.² B04B *11/06*

U.S. Cl. 233—21 **8 Claims**

1. Apparatus for separating a mixed liquid containing components of different specific gravities, comprising an outer cylinder means having a discharge opening at a lower portion thereof through which separated components of higher specific gravity are discharged, an inner cylinder means disposed in said outer cylinder means, drive means for rotating said inner cylinder means, inlet means for introducing said mixed liquid to said inner cylinder means, said inner cylinder means having a concentric opening at the upper longitudinal end thereof through which separated components of lesser specific gravity pass, receiving means mounted on said outer cylinder means for receiving said separated components of lesser specific gravity from said concentric opening, disk means mounted within said inner cylinder means, said disk means being disposed at the lower end portion of said inner cylinder



means and being arranged such that generally inner and outer concentric columns of separated components of lesser and greater specific gravities respectively extend between said disk means and said upper longitudinal end of said inner cylinder means, said outer concentric column of separated components of higher specific gravity passing to said discharge opening in said outer cylinder means.

3,931,929

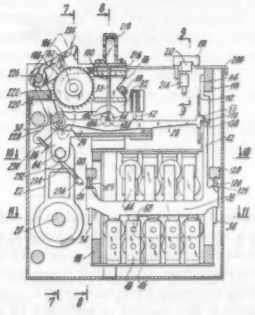
TAPE PERFORATOR

Leon N. Canick, 6700 192 St., Fresh Meadows, N.Y. 11365, and Charles S. Aldrich, R.F.D. 1, Stillwater Road, St. James, N.Y. 111780

Filed Mar. 10, 1975, Ser. No. 557,230

Int. Cl.² G06K *1/02*

U.S. Cl. 234—110 **7 Claims**



1. In a high speed tape perforator that includes:

a. a cradle pivotally mounted on a fixed support for oscillating movement about a first transverse axis:

b. drive means for oscillating the cradle about said first axis;

c. a first plurality of elongated lift levers pivotally mounted proximate one end thereof in the cradle for selective oscillating movement about a second, transverse axis that is substantially parallel to and spaced from the first axis;

d. an elongated punch mounted at one end on each of the first lift levers proximate the first axis, the longitudinal axis of each punch being substantially perpendicular to the first axis, the axes of the punches being in a plane that is approximately coincidental with the first axis;

e. means for advancing the tape along a plane that traverses the plane of the longitudinal axes of the punches;

f. a second plurality of elongated fulcrum levers equal in number to the first plurality of lift levers, the second plurality of levers being pivotable about axes that are substantially parallel to the planes of the first levers and movable between a first, non-punching mode position and a second, punching mode position whereby, in the first position of the second levers, the cradle and the first levers oscillate as a unit about the first axis and the punches are substantially devoid of movement in directions along the longitudinal axis thereof so that the punches do not perforate the tape and whereby, in the second position, the second levers interfere with the movement of the first levers so that the cradle continues to oscillate about the first axis but the first levers oscillate about the second axis to cause the punches to move longitudinally above the plane of and through the tape; and

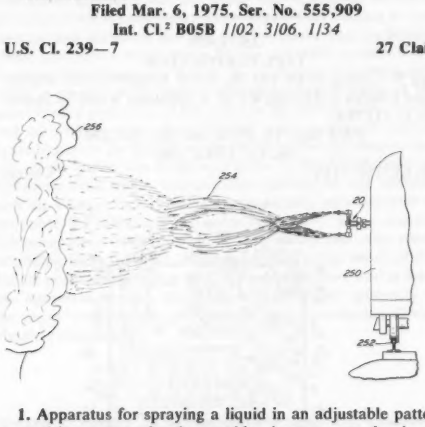
g. means for selectively moving the second levers from the first position to the second position, the improvement comprising:

a. means for slowing down the movement of the first plurality of lift levers and the punches mounted thereon during the periods of time that the second plurality of fulcrum levers travel between the first and second positions thereof.

3,931,930
VARIABLE SPRAY APPARATUS AND METHOD

John E. Waldrum, Ambler, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed Mar. 6, 1975, Ser. No. 555,909
Int. Cl.² B05B *1/02, 3/06, 1/34*
U.S. Cl. 239—7 **27 Claims**

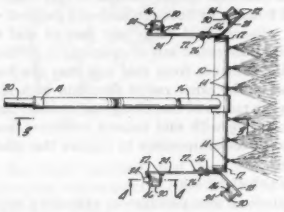


1. Apparatus for spraying a liquid in an adjustable pattern comprising a spray head rotatable about a central axis and having at least one nozzle including an orifice for providing a liquid stream therefrom, said nozzle being mounted on a radial axis extending normally from said central axis and means for readily adjusting the angular orientation of said nozzle with respect to said central axis, without stopping the liquid stream to enable the nozzle's orifice to extend at any predetermined angle within the range of parallel to the central axis up to an angle of approximately 45° with respect thereto, whereupon when said nozzle is adjusted by said adjustment means to the orientation wherein its orifice is parallel to said central axis the apparatus provides a liquid stream in a relatively straight line parallel to said central axis and when said nozzle is adjusted by said adjustment means to the orientation wherein its orifice is at some other angle with respect to said central axis the liquid stream from said nozzle creates a reaction force having a component at said nozzle which is tangential to said radial axis to effect the rotation of the nozzle about said axis, thereby creating a helical spray pattern about the axis, with the diameter of said pattern being a function of the angular orientation of said nozzle.

3,931,931
SURFACE WASHER

George A. Otis, 715 E. Los Angeles Drive, Vista, Calif. 92083

Filed Feb. 20, 1975, Ser. No. 551,246
Int. Cl.² B05B *1/20, 15/06*
U.S. Cl. 239—287 **10 Claims**



1. A surface washer comprising a horizontal pipe fitted with a plurality of spaced apart nozzles, casters for moving said pipe over a surface to be washed, a hollow handle attached to said pipe for rotating said nozzles at various angles to said surface and for supplying water under elevated pressure to the interior of said pipe; in which the improvement comprises:

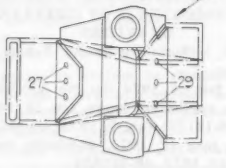
a. said horizontal pipe being supported by a plurality of at least three casters to obtain a horizontally stable support, a caster assembly comprising at least one caster supporting each end of said pipe; and,

b. said horizontal pipe being rotatably attached to said caster assembly supporting each of its ends by a link having one of its ends fixedly attached to one of said caster assembly and said end of said horizontal pipe, and having its other end rotatably attached to the other of said caster assembly and said end of said horizontal pipe.

3,931,932
LIQUID SPRAYER

John Frederick Stratton, Great Harwood; Thomas Haddow, Burnley, and Eric Gates, Barrowford, all of England, assignors to Lucas Aerospace Limited, Birmingham, England

Filed July 5, 1974, Ser. No. 485,974
Claims priority, application United Kingdom, July 12, 1973, 33338/73
Int. Cl.² B05B *7/00*
U.S. Cl. 239—431 **5 Claims**



1. A liquid sprayer comprising a first passage through which, in use, gaseous fluid passes, and a second passage through which, in use, liquid passes, said first passage having a cross-sectional area which decreases from an inlet plane thereof to a throat and increases from said throat to an outlet plane thereof, and said second passage opening into the first passage at a point in the region of said throat where the cross-sectional area is less than the cross-sectional area at said outlet plane, the cross-sectional shape of said first passage in said

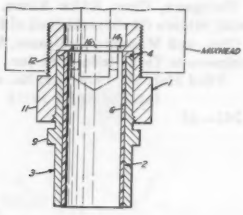
region of said throat changing from one dimension thereof being smaller than the other dimension to said one dimension being greater than said other dimension.

3,931,933

METHOD OF AND APPARATUS FOR THE POURING OF FAST FOAMING REACTANTS

John G. Cairns, McMurray; John L. McPherson, Bethel Park, and James D. Orefice, Coraopolis, all of Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed June 27, 1974, Ser. No. 483,585
Int. Cl.² B05B 15/02; F16L 57/00
U.S. Cl. 239—591 4 Claims



1. A nozzle assembly for use with fast forming reactants comprising:

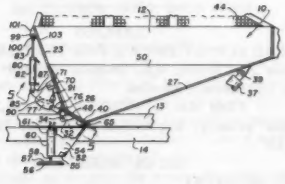
a generally tubular nozzle having a smooth internal bore and having a connecting means on its external surface, a generally tubular nozzle housing having a connecting means on a portion of its exterior surface adapted to engage a mixhead and having a first internal bore separated from a second internal bore by a traverse wall having a centrally located aperture, said first bore containing a portion of said nozzle and having connecting means in engagement with the connecting means of said nozzle and said second bore being adapted to mate with said mixhead, and a disposable nozzle liner disposed within the bore of said nozzle having a generally smooth internal bore and a radially outwardly directed annular flange disposed between the traverse wall of said nozzle housing and the end of said nozzle disposed within said nozzle housing and forming a sealing relationship with said nozzle and said traverse wall.

3,931,934

PARTICULATE MATERIAL SPREADING APPARATUS

Francis V. Smith, 3931 198 St., Langley, British Columbia, Canada (V3A 1C9)

Filed Nov. 6, 1974, Ser. No. 521,279
Claims priority, application Canada, Nov. 30, 1973, 187073
Int. Cl.² E01C 19/20; B60P 1/16; F16K 29/02
U.S. Cl. 239—657 12 Claims



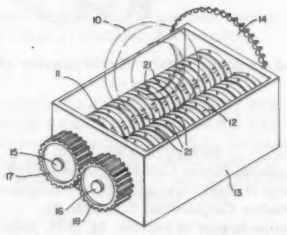
1. Spreading apparatus comprising a dump body for holding particulate material and adapted to be hingedly mounted on a vehicle so as to be tipped upwardly towards and end of the body, an outlet in the body near said end thereof, a plate valve slidably mounted to move back and forth in a longitudinal direction across the outlet to close and open siad outlet, operating means connected to the plate valve for moving said valve back and forth between positions fully opening and closing said outlet, and oscillating means connected to the valve plate for oscillating said plate in said longitudinal direction when the valve is in an outlet opening position.

3,931,935

METHOD OF AND APPARATUS FOR CUTTING VEHICLE TIRES

Merle A. Holman, 8873 Warnerville Road, Oakdale, Calif. 95361

Filed June 24, 1974, Ser. No. 482,378
Int. Cl.² B02C 7/04
U.S. Cl. 241—24 19 Claims



17. The method of cutting fiber reinforced resilient material such as vehicle tires and the like into smaller parts by passing said materials between a pair of generally cylindrical rolls, said method comprising the steps of:

a. providing both said rolls with a plurality of axially spaced radially extending ribs having opposed planar surfaces with radial dimensions greater than the thickness of said resilient material;

b. positioning said rolls with their axes parallel to each other and with said ribs of each roll meshing with said planar surfaces of said ribs of one roll substantially in contact with and overlapping said planar surfaces of said ribs of said other roll by an amount which is less than the maximum thickness of said resilient material;

c. counter-rotating said rolls with respect to each other about their respective axes;

d. feeding said resilient material between said rolls; and

e. forcing the cut parts of said resilient material from between said ribs of each of said rolls.

3,931,936

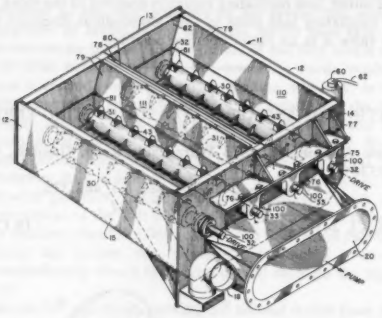
APPARATUS FOR CRUSHING SOLIDS IN A LIQUID MEDIUM

Eston F. Petry, McMurray, Pa., and Ronald W. Umphrey, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed June 5, 1974, Ser. No. 476,349
Int. Cl.² B02C 23/36
U.S. Cl. 241—46.15 6 Claims

1. In a slurry hopper having sidewalls, first and second endwalls, and a bottom wherein said bottom slopes from said first endwall to said second endwall, a water inlet means at said first endwall for partially filling said slurry hopper with water, an outlet in said second endwall, an improvement comprising a product sizing unit having a plurality of cylindrical rolls journaled substantially parallel with the surface of the water in said slurry hopper, said cylindrical rolls including a plurality of spaced peripheral teeth along the length of said cylindrical rolls, means for counter-rotating adjacent rolls of

said plurality of cylindrical rolls, and means for maintaining the level of said water in said slurry hopper between the upper



surface and the lower surface of said plurality of cylindrical rolls.

3,931,937

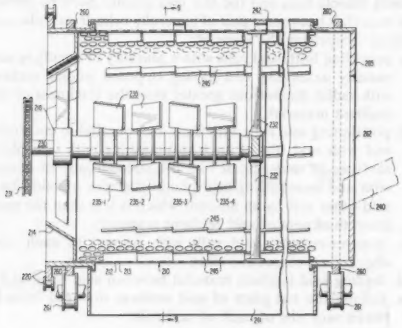
BREAKER/CRUSHER

William F. Hahn, Devon; Carl R. Graf, Whitehall, both of Pa., and George H. Hart, Newcastle, Maine, assignors to Pennsylvania Crusher Corporation, Broomall, Pa.

Continuation-in-part of Ser. No. 267,936, June 30, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 417,335

Int. Cl.² B02C *13/06*

U.S. Cl. 241—74 **19 Claims**



1. In apparatus for reducing coal and other materials, said apparatus including a hollow rotatable drum having an opening therin to receive feed material and wall means including screening openings to discharge material of desired size, lifter shelves positioned on the inner surface of said wall means for lifting and dropping material within the drum as the drum is rotated, rotor means including a rotor shaft and shaft-mounted material impacting means positioned within at least a portion of the length of the drum for impacting material dropped from said shelves, drum drive means for rotating said drum, and rotor drive means for rotating the rotor, the improvement which comprises:

a. said drum drive means is connected to said drum for driving said drum at a speed in the range of about 70 to about 95% of critical speed;

b. said lifter shelves are positioned on the drum at predetermined angle of inclination, ranging from 0° up to 70° in a direction opposite to the direction of drum rotation, which angle will cause said material to drop from said shelves into contact with said impacting means at or near the crest of the orbit of the impacting means when said drum is rotated at said speed, and which will direct the material from above one side of the rotor shaft to the other side of the rotor shaft in the direction of the downrunning side of said rotor shaft; and

c. said drum drive means and rotor drive means being connected to said drum and rotor respectively for driving said drum and rotor in the same direction of rotation, whereby material struck by said rotor is flung against the downrunning wall of said drum.

3,931,938

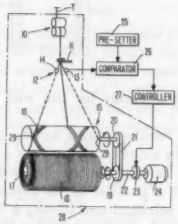
METHOD AND APPARATUS FOR WINDING YARN INTO YARN PACKAGE

Katsumi Hasegawa, Otsu; Ichiro Kumo, Shiga; Chikayasu Yamazaki; Minoru Okabayashi, both of Kyoto; Takao Nakayama, Otsu, and Masahiro Oshiyama, Shizuoka, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 18, 1974, Ser. No. 451,914

Int. Cl.² B65H *59/38*

U.S. Cl. 242—45 **18 Claims**



1. A method for winding a yarn into a yarn package by use of a winding apparatus which comprises the steps of:

1. supplying the yarn to the winding apparatus at a substantially constant speed,
2. setting a desired value of the tension,
3. reciprocally traversing the yarn longitudinally along said package,
4. contacting the yarn with a force transducer at each extremety of the yarn traverse stroke and disengaging the yarn from the force transducer when the yarn is between the extreme ends of the traverse stroke.
5. detecting the tension of the yarn with the force transducer at each extremity of the yarn traverse stroke during the time the yarn is contacting said transducer,
6. comparing the magnitude of the detected tension with that of the desired value,
7. obtaining the difference in magnitude between the detected tension and the desired value as a controlling value, and
8. controlling the circumferential speed of the yarn package according to the controlling value.

3,931,939

THREAD SUPPLY DEVICE FOR TEXTILE MACHINES

Karl Isac Joel Rosén, Hjo, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

Filed Mar. 8, 1974, Ser. No. 449,260

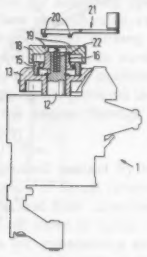
Claims priority, application Germany, Mar. 15, 1973, 2312933

Int. Cl.² B65H *51/20*

U.S. Cl. 242—47.01 **7 Claims**

1. In a positive thread supply device for a textile machine, particularly a knitting machine, having thread drum means upon which a thread issuing from a thread bobbin can be wound to form an intermediate thread supply and from which the thread can be unwound at an unwinding speed substantially equal to the winding speed to permit positive thread

supply to a textile machine, rotatable winding shaft means for causing thread to be wound on said drum means when said shaft means is rotated, and drive means drivingly interconnected to said shaft means for causing rotation thereof, comprising the improvement wherein clutch means drivingly connects said drive means to said shaft means to permit positive thread supply, said clutch means being maintained in an engaged position when said drive means is activated to permit thread to be wound on said drum means at a speed substantially equal to the speed at which the thread is also being unwound from said drum means, said clutch means being releasable to disconnect said winding shaft means from said drive means when the latter is at a standstill, said clutch means including a first clutch part drivingly connected to said drive



means and a second clutch part drivingly connected to said winding shaft means, said first and second clutch parts being normally maintained in engagement but being relatively movable away from one another to permit clutch disengagement, and connecting means adapted for engagement with an auxiliary driving means to permit selective rotation of said shaft means when said clutch means is disengaged so that the intermediate thread supply on said drum means can be replenished, said connecting means including means associated with said clutch means and engageable with said auxiliary driving means for causing (1) relative movement between said clutch parts into a position of clutch disengagement and (2) rotation of said second clutch part independently of said first clutch part to selectively rotate said shaft means upon rotation of said auxiliary driving means.

3,931,940

CARPET FEEDING, MEASURING AND ROLLING APPARATUS

Edwin H. Raighn, Los Alamitos; Robert B. Eglinton, South Pasadena; Lorne L. Frazier, Torrance; Robert R. Naylor, Granada Hills, and William R. Morris, Newport Beach, all of Calif., assignors to Chromalloy American Corporation, New York, N.Y.

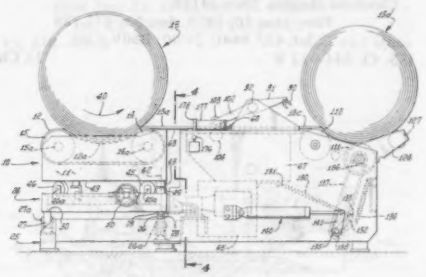
Filed May 10, 1974, Ser. No. 468,660
Int. Cl. B65h *19/20;* **B61h** *17/08*
U.S. Cl. 242—56 R **32 Claims**

1. In pliable sheet handling apparatus,

a. first means to rotate a sheet supply roll at a first station and in an unrolling direction to advance unrolled sheet extent in a generally longitudinally forward direction, and to sever unrolled sheet extent laterally crosswise thereof at a selected longitudinal location to free a section of the unrolled sheet from the supply roll,

b. other means to receive the severed section at a subsequent station located generally forwardly of the first station, and to re-roll said section forming a final roll, and

c. support means located generally between said first and other means to receive and support the advancing unrolled sheet extent in position for said severing, said support means including a table having an upper surface, there being multiple ports proximate said surface to underlie said unrolled sheet extent, and means to supply gas to discharge from said ports for exerting upward pressure



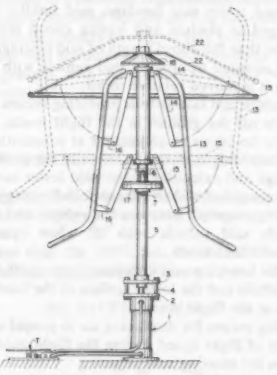
on said unrolled sheet extent and tending to float said sheet extent as it advanced forwardly.

3,931,941

PNEUMATICALLY OPERATED SWIFT FOR HOLDING SKEINS OF YARN TO BE UNWOUND VERTICALLY

Hal E. Hornbuckle, Mount Holly, N.C., assignor to Belmont Textile Machinery Co., Inc., Mount Holly, N.C.

Filed Sept. 30, 1974, Ser. No. 510,457
Int. Cl.² B65H *75/24*
U.S. Cl. 242—110 **2 Claims**

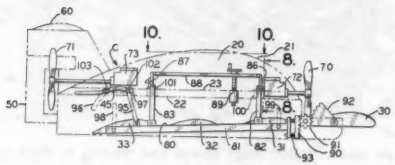


1. A pneumatically operated swift for holding skeins of yarn to be unwound vertically comprising a base, a tubular center post extending upwardly therefrom, a series of skein supporting arms spaced around said center post, a sleeve carried by said center post for turning movement thereabout, upper and lower sets of linkage means connecting said arms to said sleeve so that said arms can expand and retract relative to said center post, pneumatically operated pressure applying means cooperably related with said lower set of linkage means for moving the same to expand said arms, said pressure applying means including a pressure applying ring slidably mounted on said center post beneath the connection of said lower set of links with said sleeve, said center post having oppositely arranged guide slots therein, a plunger within said center post, a cross pin on said plunger having end portions extending through said slots and engaging said pressure applying ring and air actuated cylinder and piston means operably related with said plunger to lift the same to cause said pressure applying ring to engage said lower set of links to move the same outwards and upwards to expand said skein supporting arms.

3,931,942
AIR CAR

Martin Aaron Alpert, 3207 Meadowbrook Blvd., Apt. 9, Cleveland Heights, Ohio 44118

Filed June 10, 1974, Ser. No. 477,788
Int. Cl.² B64C *29/00*; B60V *3/08*
U.S. Cl. 244—12 R 16 Claims



3. A vehicle of the character described capable of flight as an aircraft in the flight mode and movement along the ground in the ground effect mode comprising:

a fuselage, said fuselage being streamlined and having a curved convex upper surface and a lower surface, said upper surface having a greater surface area than said lower surface and being shaped to enable said fuselage to experience aerodynamic lift when moved relative to air,

a plurality of laterally extending airfoils of smaller size disposed under said fuselage, said smaller airfoils being arranged in tandem and having chord lengths that are shorter than the chord length of said fuselage, said airfoils being adapted to provide said vehicle with aerodynamic lift as it is moved relative to air,

said fuselage and said airfoils providing means for lifting the vehicle off the ground in the flight mode, whereby the vehicle functions as an aircraft at substantial altitudes,

means including a pair of sidewalls depending from said fuselage and extending below said lower surface near the terminal end of said smaller airfoils for trapping a cushion of compressed air between the vehicle and the ground to provide said vehicle with lift when operating in the ground effect mode,

means for lowering said airfoils to increase the gap between the airfoils and the lower surface of the fuselage for operation in the flight mode,

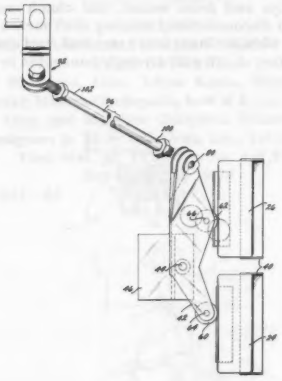
propelling means for displacing air to propel said vehicle in excess of flight speed during the flight mode, and airfoil means for steering said vehicle.

11. A process of operating a vehicle having a fuselage shaped like an airfoil, airfoil means for steering the vehicle, and a power plant for imparting forward thrust to the vehicle, said fuselage being streamlined and having a curved convex upper surface with greater surface area than its lower surface to enable the fuselage to provide aerodynamic lift, said process comprising the steps of providing a plurality of horizontally spaced spaced airfoils of smaller size having chord lengths that are shorter than the chord length of said fuselage, said airfoils extending laterally and being of a size and shape to provide said vehicle with aerodynamic lift as it is moved relative to air, positioning said airfoils in tandem and away from said fuselage to cause them to impart maximum lift to the vehicle and to enable the vehicle to maneuver as an aircraft in a flight mode at substantial altitude remote from the ground, thereafter causing said airfoils to move bodily in a vertical direction relative to said fuselage to reduce the lift imparted to the vehicle while providing a plenum chamber below said fuselage and blowing air into said plenum chamber to provide a cushion of compressed air under the fuselage, whereby said vehicle travels proximate to the ground in a ground mode with insufficient lift for flight.

3,931,943
AIRPLANE RUDDER AND CONTROLS

Don M. Westergren, La Mesa, and Walter E. Mooney, San Diego, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Aug. 30, 1974, Ser. No. 502,057
Int. Cl.² B64C *19/02*
U.S. Cl. 244—86 6 Claims

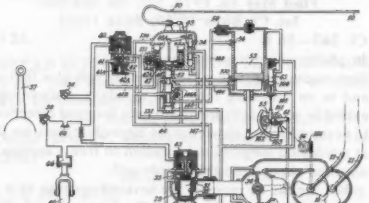


1. A rudder actuator which comprises a pair of actuator pedals pivoted to the interior of the cabin, pivotal crank means comprising a pair of crank plates joined along adjacent edges thereof, follower means comprising rollers journalled in said crank plates adjacent said actuator pedals cooperating with said actuator pedals to pivot said crank means between its extreme positions, a connecting rod movably connected to said crank means and effective to transfer the movement of said crank means to said rudder.

3,931,944
THRUST REVERSAL SYSTEM FOR JET AIRCRAFT ENGINES

Terence John Capewell, Brewood; Arthur Leslie Lloyd, and David Marshall, both of Wolverhampton, all of England, assignors to Lucas Aerospace Limited, Wolverhampton, England

Filed Mar. 21, 1974, Ser. No. 453,411
Claims priority, application United Kingdom, Mar. 21, 1973, 13697/73
Int. Cl.² B64D *33/04*
U.S. Cl. 244—110 B 7 Claims



1. A thrust reversal system for a jet aircraft engine comprising:

thrust reverser buckets movable between a stowed and a deployed position;

an air motor capable of rotation in opposite directions and connected to impart movement to the buckets;

a pilot's control operative to select movement of the buckets to the stowed position and to the deployed position;

a flow control valve controlling the direction of flow of operating air to the motor;

locking mechanism operative, when the buckets are in the stowed position, to lock the buckets positively against movement to the deploy position without impeding movement of the buckets towards the stowed position;

means maintaining the flow control valve, when the buckets are in the stowed position, in a position corresponding to movement of the motor in the direction to stow the buckets;

means responsive to selection of movement of the buckets to the deploy position for admitting operating air to the motor through the flow control valve, releasing the locking mechanism and thereafter moving the flow control valve to its alternative position to enable the motor to move the buckets to the deploy position;

a shut off valve which normally prevents the flow of air from the compressor of the engine through the flow control valve to the air motor;

first valve means;

means responsive to ground contact by wheels of the aircraft following selection of thrust reversal by said pilot's control for operating said first valve means and thereby permitting said shut off valve to open;

a second valve means for maintaining said shut off valve open when ground contact by the wheels is lost; and

means for automatically decelerating the motor when the buckets approach both the stowed position and the deployed position.

3,931,945

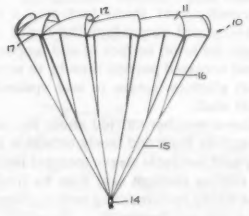
ROTATING PARACHUTE

Oscar W. Sepp, Glen Cove, N.Y., assignor to ILC-Steinthal, Inc., Roxboro, N.C.

Continuation of Ser. No. 225,535, Feb. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 20,331, March 17, 1970, abandoned. This application Aug. 7, 1974, Ser. No. 495,397

Int. Cl.² B64D *17/18*

U.S. Cl. 244—145 **16 Claims**



10. A rotating parachute comprising a plurality of air foil-like fabric panels arranged leading edge towards trailing edge in a ring with an opening between the leading and trailing edges of adjacent panels, and means for forming each of said panels into a vane which acts as an independently inflatable rotating decelerator on its own, said means comprising suspension means secured along the radially inward and radially outward edges of said panels and coming together below said panels to form an individually inflatable rotating decelerator of each panel.

3,931,946

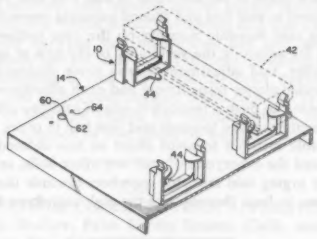
TERMINAL BLOCK MOUNTING BRACKET

Edmund John Soltysik, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 23, 1975, Ser. No. 543,609

Int. Cl.² H02B *1/02*; F16L *3/22*

U.S. Cl. 248—68 R **16 Claims**



1. A bracket for retaining a rectilinear terminal block or the like at a stand-off position above a support panel, said bracket including a base adapted to abut said panel, fastening means extending downwardly from said base for retention of the bracket on said panel, a pair of substantially rigid walls extending upwardly from opposite ends of said base, angularly disposed flange means extending from each wall toward the other wall in diverging relationship to the base, relatively short stiffly resilient arm means extending upwardly from the free ends of each of said walls, each arm including a cam lead-in surface terminating in a shoulder intermediate the ends of said arm, said angularly disposed flanges serving the dual function of accepting terminal blocks having varying grip tolerances, as well as to stress said shoulders and walls inwardly into more positive engagement with said terminal blocks when said flanges are depressed.

3,931,947

ADJUSTABLE BASE, NOTABLY FOR TOPOMETRY APPARATUS

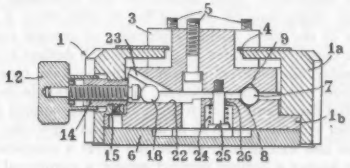
Luc Andre Tagnon, Saint Mande, France, assignor to Essilor International (Compagnie Generale d'Optique), Joinville-le-Pont, France

Filed Mar. 28, 1975, Ser. No. 562,890

Claims priority, application France, Apr. 11, 1974, 74.12808

Int. Cl.² F16M *11/12*

U.S. Cl. 248—180 **6 Claims**



1. An adjustable base for topometric and similar apparatus, which comprises a case opening upwards and comprising a bottom having a substantially flat and horizontal inner face with a recess within said face, a movable member in said case having a substantially vertical axis, adapted to be secured to the topometric apparatus and comprising a lower, substantially flat face opposite said flat inner face of the case bottom and having a recess formed within said lower flat face which registers with the recess of said case bottom, a first ball received in said registering recesses and constituting a swivel point for said movable member in relation to said case, a pair of passages located in substantially vertical planes and perpen-

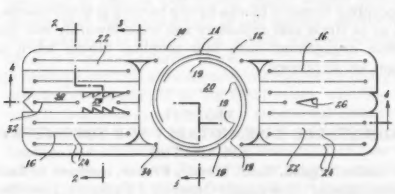
dicular to each other, said planes intersecting each other along a straight line passing through the centre of said first ball, each passage being formed partly in the inner face of said case bottom and partly in the opposite lower face of said movable member, a first one of said passages being defined by a flat surface and by a V-sectioned groove converging toward each other in the direction of said first ball, the second passage being defined by two other V-sectioned grooves converging toward each other in the direction of said first ball, two other balls disposed in said first and second passages respectively for supporting said movable member on the case bottom, a pair of screws for adjusting the verticality of the axis of said movable member, said adjustment screws being disposed in said perpendicular planes respectively and each adjustment screw being adapted to push a respective one of said two other balls in the relevant passage towards said first ball in order to cause said movable member to pivot about an axis defined by said first ball and the other, one of said two other balls, and spring means for urging said movable members towards the bottom of said case to bear thereagainst through said three balls.

3,931,948

SUSPENSION HOLDERS FOR CONTAINERS AND OTHER ARTICLES AND BLANKS FOR FORMING THE SAME

Stanley I. Mason, Jr., Weston, Conn., assignor to Simco, Inc., Weston, Conn.

Filed Sept. 26, 1974, Ser. No. 509,560
Int. Cl.² A61B *19/00*
U.S. Cl. 248—318 **7 Claims**



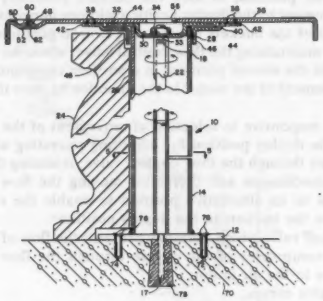
1. An integral substantially flat, cut sheet article holder capable of supporting at least one or more articles in balanced vertical suspension upon separation and extension of cut portions, comprising an integral flat flexible sheet, a center portion of the sheet having a plurality of arcuate cuts, the arcuate cuts being located in an area which defines generally an annular circumferential region, the arcuate cuts being offset from one another within the annular region in the plane of the flat sheet, cuts of each arcuate cut overlapping at least two other arcuate cuts so as to define upon separation of cut portions and extension from the flat sheet a receptacle-like portion having a bottom support means, a peripheral collar-like portion and upright side support portions secured through one of their respective ends to the bottom support means and through the other of their respective ends to the collar-like portion, the flat sheet material surrounding the annular circumferential region being further cut with a plurality of a series of cuts offset from one another in the plane of the flat material but partially overlapping in an alternate reverse cut manner to define, upon separation of the material at the cuts and extension thereof, a plurality of post-like extension portions integral with the receptacle-like portion, the portions of the sheet defined by the cuts being substantially contiguous when the flexible sheet is in flat condition so that essentially all the material of the sheet is utilized in the holder.

3,931,949

SECURITY PEDESTAL BASE

Gordon J. Waligorski, 4713 Nottinghamshire Drive, Louisville, Ky. 40299, and Roy F. McMahan, Sr., 2950 Breckinridge Lane, Louisville, Ky. 40220

Filed Oct. 2, 1974, Ser. No. 511,177
Int. Cl.² F16M *13/00*
U.S. Cl. 248—418 **9 Claims**



1. A high security pedestal base for supporting a variety of apparatus there atop, comprising in combination,
a base,
an upstanding support mounted on said base,
said upstanding support having at least a partial hollow interiorly thereof,
a support shaft positioned interiorly of said upstanding support within said hollow and mounted on said base,
support platform means for supporting said apparatus mounted on said support shaft and extending outwardly beyond the periphery of said upstanding support, with
a cup plate having an outwardly extending circumferential flange and having a central aperture positioned in the cup portion thereof, said cup plate being engageably mounted on said support shaft, said support platform means being rotatably mounted on said cup plate and adapted to carry a variety of apparatus thereon,
and said support platform means further including a circumferential shield mounted on the lower surface thereof and extending downwardly therefrom along the outer surface of said upstanding support to conceal access to said cup plate when said support platform is mounted in position atop said support shaft,
said circumferential shield including a recessed portion entrapping said circumferential flange of said cup plate between the lower surface of said support platform means and said recessed portion thereby to securely engage said support platform means to said upstanding support and support shaft,
and a sleeve member carried about the outer periphery of said support shaft and freely rotatable thereabout,
whereby said rotatable sleeve member inhibits the unauthorized cutting through said base by freely rotating in response to the reciprocating action of any cutting member making contact therewith.

3,931,950

TOOTHPASTE TUBE SUPPORTING DEVICE

Michael A. Javillonar, Danbury, Conn., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

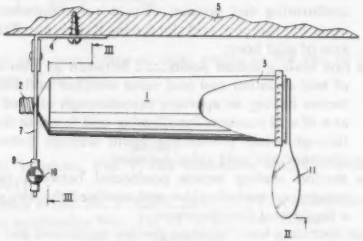
Filed Oct. 4, 1974, Ser. No. 512,023
Int. Cl.² B65D *35/56*
U.S. Cl. 248—108 **1 Claim**

1. A toothpaste tube supporting device for supporting a substantially flexible toothpaste tube having an open neck part

through which toothpaste in the tube is ejected and an opposite end part, said toothpaste tube supporting device comprising

a substantially plate like support member having a first part affixed to a supporting surface and a second part extending substantially perpendicularly from the first part and the supporting surface, said support member having a substantially semicircular groove formed in an edge thereof;

a clamp member pivotally affixed to the second part of the support member for movement in the plane of said second part and having a substantially semicircular groove



formed in an edge thereof and forming a circular groove with the groove formed in the support member when the clamp member is in closed position with the support member with the grooved edges of the members in juxtaposition for accommodating the neck part of a toothpaste tube; and

a holding device for releasably maintaining the clamp member and the support member in closed substantially coplanar relation with each other and forming a substantially circular groove between them consisting of the semicircular grooves of the members for accommodating the neck part of a toothpaste tube secure between said members to enable the tube to be emptied.

3,931,951

MOBILE PALLET FOR AN INSTALLATION FOR PRODUCTION OF PRE-FABRICATED ELEMENTS OF CONCRETE

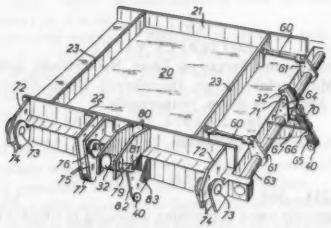
Edouard Marie Fougea, Paris, France, assignor to Constructions Edmond Coignet, Paris, France

Filed Nov. 6, 1972, Ser. No. 303,867

Claims priority, application France, Nov. 23, 1971, 71.41790

Int. Cl.² B28B 7/04

U.S. Cl. 249—158 **10 Claims**



1. In an installation for the manufacture of prefabricated elements, of plain or reinforced concrete, a mobile pallet comprising: a pouring table, a plurality of molding cheeks continuously coupled to said table and movably mounted individually with respect to said table between a closure position adapted to form with said table a cavity for molding said concrete elements, and an open position permitting de-molding of said elements; and means mounted on said table and associated with each said cheek for actuating the opening and closure of said cheeks and for locking said cheeks in the closed position, said molding cheeks include a high cheek and a low cheek, means mounting said high cheek and said low cheek for pivotal movement about fixed shafts disposed parallel to one another, said molding cheeks further including two side cheeks, and means slidably mounting said side cheeks for movmement between said high cheek and said low cheek independently thereof, said means slidably mounting said side cheeks including a rotatably mounted shaft having crank elements, and means coupling said crank elements to an adjacent one of said side cheeks for effecting sliding thereof in response to rotation of said rotatably mounted shaft.

3,931,952

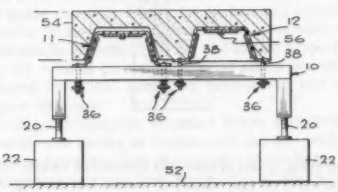
MULTIPLE CONCRETE FORM APPARATUS

Stephen S. Dashew, Palos Verdes Estates, Calif., assignor to Interform, Inc., Compton, Calif.

Division of Ser. No. 219,060, Jan. 19, 1972, Pat. No. 3,804,930. This application June 11, 1973, Ser. No. 368,716

Int. Cl.² B28B 7/28

U.S. Cl. 249—177 **6 Claims**



1. Apparatus for forming concrete comprising:

a subform;

a plurality of forms with lower portions resting on said subform, each form having a base wall and at least two side walls extending with vertical directional components from the base wall for supporting concrete poured thereon; and

a plurality of spaced fastener means for confining each of said forms to a predetermined lateral position with respect to said subform and preventing rotational movement of the form with respect to the subform, while permitting relative vertical movement of each of said forms and their lower portions with respect to said subform form independently of relative vertical movement of other forms to the subform within a limited distance of at least one inch of vertical movement, whereby to prevent loss of a stuck form from the subform while permitting sufficient vertical movement to allow the subform and unstuck forms thereon to strip away from set concrete.

3,931,953

ULTRA HIGH VACUUM VALVE

William Arthur Allen, Clarksburg, Md., assignor to Communications Satellite Corporation (Comsat), Washington, D.C.

Filed May 9, 1974, Ser. No. 468,792

Int. Cl.² F16K 31/143

U.S. Cl. 251—62 **4 Claims**

1. A vacuum valve for a conduit having a slot transverse to the primary direction of flow comprising:

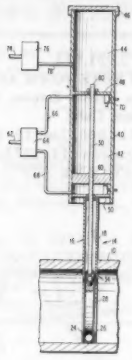
a. a chamber means adaptable to being placed in the slot in said conduit, a first portion of said chamber means having an orifice permitting flow through the conduit and being adapted to extend into the conduit through said trans-

verse slot and be sealingly connected to the conduit and a second portion thereof extending out of said conduit;

b. a valve disc movably mounted within said chamber for transverse movement relative to the conduit between an operative-conduit position within the conduit, wherein said orificie is covered, and an inoperative-conduit position outside the conduit, wherein said orifice is uncovered;

c. an inflatable sealing means disposed about the periphery of said disc;

d. a hollow valve stem secured to said disc in fluid communication with said inflatable means and extending outwardly of said chamber means;



e. operating means operatively connected to said valve stem externally of said chamber means for moving said disc within said chamber; and

f. pressure means operatively connected to said hollow valve stem for supplying a pressurized medium to said inflatable means in both said operative position and said inoperative position of said disc to expand said inflatable means into air tight sealing engagement with said chamber means, whereby leakage past the valve disc in the operative-conduit position and about the disc from the chamber in the inoperative-conduit position is prevented.

3,931,954

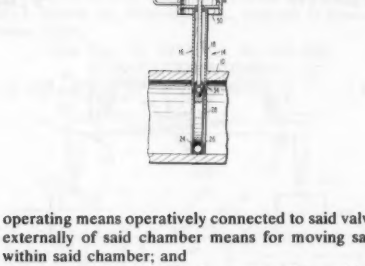
PETCOCK

Matthew P. Guzzetta, 10425 Loma Rancho Road, La Mesa, Calif. 92077

Filed Sept. 3, 1974, Ser. No. 502,390

Int. Cl.² F16K *35/04*

U.S. Cl. 251—109 **9 Claims**



1. An improved petcock for liquid flow control comprising:

a housing having a mounting flange for mating with a container having a supply of liquid therein and an orifice through one wall, an inlet passage leading from said orifice to a frusto-conic valve chamber within said housing, said chamber having its larger end portion terminating at a co-axial tubular passageway through one wall of said housing, said passageway having a greater diameter than said larger end portion of said chamber forming a shoulder therebetween the wall of the outer end of said passageway having a cut out along a portion thereof and an outlet passage leading from said chamber and terminating external of said housing, said outlet passage being co-axial with said inlet passage and perpendicular to the axis of said chamber;

a valve member positioned within said chamber and said passageway and conforming thereto for rotational sliding engagement therewith, said valve member having a bore through its longitudinal axis perpendicular to said chamber axis, a recess in the end surface of said passageway conforming end portion of said valve member and an open slot thereon, said slot having its axis parallel with the axis of said bore;

a first sealing means positioned between at least a portion of said chamber and said valve member said first sealing means having an aperture therethrough aligned with the axis of said passages for allowing said liquid to flow therethrough while preventing liquid seepage between said chamber and said valve member;

a second sealing means positioned between said valve means and said shoulder and confined thereby providing a liquid seal therebetween;

an operating lever having a portion positioned and confined within said slot covering said recess with a portion extending through said cut out portion terminating external of said housing for manually rotating said valve member from a first position wherein said bore of said valve member is co-axial with said passages allowing said liquid to flow therethrough to a second position wherein said axis of said bore is rotated out of alignment with said axis of said passages restricting the flow of said liquid into said chamber;

a compressible bias means positioned within said recess and confined and compressed therein by said lever; and

a housing cover attached to said housing, said cover closing said tubular opening and thereby confining said lever, both of said sealing means and said valve member within said housing and said passageway and compressing said bias means wherein said first seal is partially compressed between the wall of said chamber and said valve member, said second sealing means is forced against said shoulder by said valve member sealing said valve chamber and said lever is forced against the inside surface of said cover wherein locking means carried by said cover and positioned adjacent said cut out selectively locking said lever in one of said positions of said valve member.

3,931,955

BUTTERFLY VALVE

Christianus Jacobs, Bergen op Zoom, Netherlands, assignor to B.V. Machinefabriek en Ijzergieterij Holland-Bergen op Zoom, Bergen op Zoom, Netherlands

Filed Mar. 25, 1974, Ser. No. 454,427

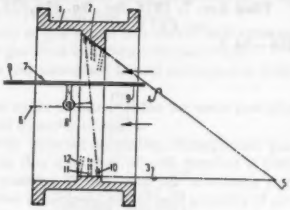
Claims priority, application Netherlands, Apr. 12, 1973, 7305162

Int. Cl.² F16K *1/276, 25/00*

U.S. Cl. 251—305 **14 Claims**

1. A butterfly valve comprising a housing in which a flat flap having an elastic rim is adapted to turn between a position in which the plane of the flap is parallel to the axis of the flow passage across the housing and a position in which the elastic rim is in sealing relationship to a seat arranged all around the axis of the passage across the housing, said seat having the shape of a cone surface, the apex of the cone being located outside the axis of the flow passage across the housing, charac-

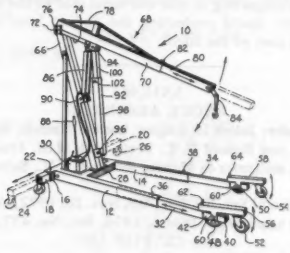
terised in that the sealing surface of the seat lies on the peripheral surface of the base of an oblique circular cone, the circular base of said cone being at right angles to the axis of the flow passage of the seat.



3,931,956
HOIST

Wallace H. Hawkins, Rte. 7, Old Buncombe Rd., Greenville, S.C. 29611

Continuation of Ser. No. 373,606, June 25, 1973, abandoned. This application Nov. 21, 1974, Ser. No. 525,839
Int. Cl.² B60P *1/48*
U.S. Cl. 254—8 B **3 Claims**

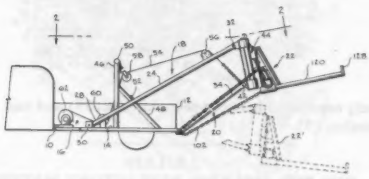


1. An apparatus including a hoist for lifting and transporting heavy objects on a surface comprising:
- a base structure having a pair of spaced outwardly extending horizontal legs;
- at least one wheel carried adjacent an inner end of said base structure for aiding in supporting said structure,
- a primary supporting wheel carried adjacent an outer end of each of said outwardly extending legs journaled for rotation about a fixed axis;
- an auxiliary wheel carried adjacent each of said primary supporting wheels;
- an adjustable means for pivotally supporting said auxiliary wheels so that said auxiliary wheels can be shifted from a first position out of contact with said surface to a second position wherein said auxiliary wheels engage said surface lifting said primary wheels out of contact with said surface;
- swivel means for journaling said auxiliary wheels so that said auxiliary wheels can swivel for adding maneuverability to said apparatus when in said second position;
- said adjustable means including a support member carried by an outer end of each of said legs with a portion extending outwardly beyond said legs;
- means for pivotally mounting said support members relative to said outwardly extending legs;
- said swivel means for journaling said auxiliary wheels being attached to an outer end of a respective support member, and
- means carried adjacent an inner end of said support members for selectively raising and lowering said outer ends for causing said auxiliary wheels to assume said first and second position.

3,931,957
LIFTING APPARATUS

John D. Thibodeaux, 4309 Los Angeles, Houston, Tex. 77026

Filed Apr. 25, 1975, Ser. No. 571,504
Int. Cl.² B66F *3/00*; B60P *1/48*
U.S. Cl. 254—127 **28 Claims**



1. Lifting apparatus for mounting on a supporting structure having an end, said lifting apparatus comprising:
- a first guide assembly having an anchor end pivotally anchorable to said support structure at a location spaced substnatially inwardly from the end of said support structure for vertical pivotal movement and a movable end disposed to extend outwardly beyond the end of said support structure;
- a second guide assembly disposed below said first guide assembly and having an anchor end pivotally anchorable to said support structure at a location closer to the end of said support structure than the location of the anchor end of said first guide assembly for vertical pivotal movement and a movable end disposed to extend outwardly beyond the end of said support structure;
- a rigid base assembly pivotally connected to the movable ends of said guide assemblies at vertically spaced points for relative vertical pivotal movement between said base assembly and each of said guide assemblies whereby said base assembly and said guide assemblies comprise a liftable assembly;
- bulkhead means mounted on said base assembly and including engagement means for engaging an object;
- and elevating means mountable on said support structure and connected to said liftable assembly for raising said liftable assembly with respect to said support structure.

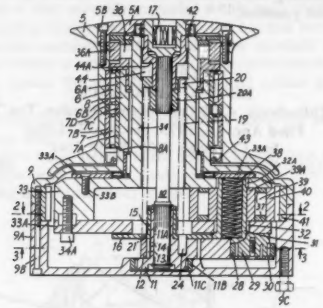
3,931,958
LOAD MOVING APPARATUS

Howard Frederick Hobbs, Napton-on-the-Hill, near Rugby, England, assignor to Variable Kinetic Drives, Ltd., England

Filed June 18, 1974, Ser. No. 480,428
Claims priority, application United Kingdom, July 3, 1973, 31668/73
Int. Cl.² B66D *1/30*
U.S. Cl. 254—150 R **6 Claims**

1. A load moving device comprising an input member (10), an inner eccentric (11) connected to the input member, an outer eccentric (12) surrounding the inner eccentric so that the two eccentrics combine to form a variable throw device, spring means (19) connected to the input member and to the outer eccentric and pretensioned to hold the eccentrics in about maximum throw position, contact elements (28) engaging the outer eccentric, a contact elements carrier (34) which serves as an output member, arms (29) pivotally carried by the carrier (34) and each carrying one of said contact ele-

ments, a reaction member (9), unidirectional clutches (39) connected with said arms respectively and gears (40) operatively connected between said clutches (39) and said reaction member (9).

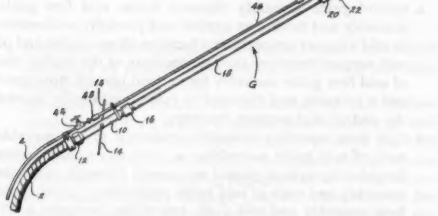


3,931,959

GUN FOR APPLYING REFRACTORY MATERIAL

George H. Truman, South Bend, Ind., assignor to A. P. Green Refractories Co., Mexico, Mo.

Filed Oct. 29, 1974, Ser. No. 518,274
Int. Cl.² B28C 5/06
U.S. Cl. 259—151 12 Claims



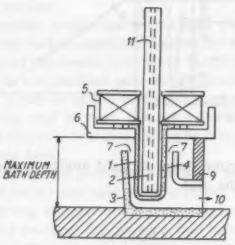
1. A gun for applying a refractory material to a surface, said gun comprising: a rigid tube into which an airstream having dry granular refractory material entrained in it is introduced so that the airstream flows through the tube, the tube having apertures therein arranged in at least one circumferential row; a closure on the tube and defining an annular chamber surrounding the tube at the apertures in the tube so that the chamber communicates with the interior of the tube through the apertures; means connected to a source of water and to the closure for directing water to the chamber, whereby the water will flow into the interior of the tube and mix with the refractory material entrained in the airstream; a straight nozzle extension extended beyond the closure on the tube so that the airstream containing the moistened refractory material passes into the material; extension where the water further mixes with the refractory material; and a nozzle tip on the nozzle extension, the nozzle tip having a discharge opening of non-circular cross-section so as to change the shape of the flow and effect a back pressure in the nozzle extension the nozzle tip containing a passage which communicates with the interior of the nozzle extension and has a turn therein so as to change the direction of the moistened refractory material passing through the nozzle tip, the nozzle tip further having a pocket along the backside of the turn therein so that some refractory material will accumulate in the pocket, whereby the refractory material will not impinge against and wear out the nozzle tip at the turn.

3,931,960

APPARATUS FOR CIRCULATING MOLTEN METAL

Pervez Jal Bamji, Banbury, England, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Apr. 7, 1975, Ser. No. 565,725
Int. Cl.² C21C 7/00
U.S. Cl. 266—34 A 11 Claims



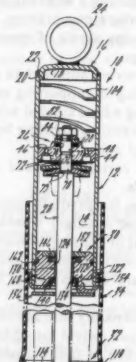
1. Apparatus for circulating molten metal in a furnace, comprising an induction coil adapted for energisation from an alternating current source, an elongate core having the coil disposed about it and projecting from both ends of the coil, said core being so disposed in relation to the coil that 25–50% of the length of the core is at one axial side of the mid-point of the coil, a refractory casing or coating protecting the part of the core projecting at said one axial side of the coil, and a heat-resistant shield protecting the coil at least at its side nearer said part of the core.

3,931,961

SHOCK ABSORBER

John H. Fader; Johan H. Keijzer, both of Hasselt; Marcel J. R. Graulus, and Roland H. C. Beets, both of St. Truiden, all of Belgium, assignors to Monroe Belgium N.V., Saint-Truiden, Belgium

Continuation of Ser. No. 307,783, Nov. 20, 1972, abandoned.
This application June 6, 1974, Ser. No. 477,475
Int. Cl.² F16F 3/07
U.S. Cl. 267—64 R 4 Claims



1. A pressurized shock absorber assembly comprising an elongated pressure cylinder adapted to contain preselected quantities of hydraulic fluid and a compressible gas,

a piston reciprocably mounted within said pressure cylinder and including valve means,

a volume of hydraulic damping fluid within said cylinder cooperable with said valve means for damping reciprocable movement of said piston,

a quantity of gas within one end of said cylinder and defining a gas-fluid interface with said fluid,

a piston rod connected to and reciprocable with said piston, and

a helical baffle member within the same end of said cylinder as said quantity of gas,

said baffle member extending through said gas-fluid interface so that a portion of said member is disposed within said quantity of fluid and the remaining portion of said member is disposed within said quantity of gas, said baffle member extending radially of said cylinder so as to have the outer periphery of the convolutions thereof engageable in a slight interference fit with the inner periphery of said cylinder, with said member comprising the sole element between said piston and said end of said cylinder within which said quantity of gas is located, whereby said member will act to minimize aeration of said fluid upon reciprocal movement of said piston and piston rod.

3,931,962

VISE FOR BIAS-CUTTING SAWING MACHINES

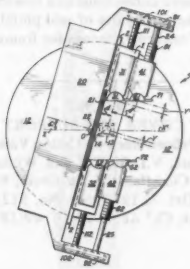
Fernand Delplanque, Nice, France, assignor to Mecaval International, Saint Chamond, France

Filed Apr. 26, 1974, Ser. No. 464,483

Claims priority, application France, May 10, 1973, 37.17601

Int. Cl.[2] B25B 1/22

U.S. Cl. 269—55 10 Claims



1. A vise for a bias-cutting sawing machine for the miter cutting of elongated metallic sections, in which the saw is pivotable relative to the longitudinal axis of the section to be cut, said vise including

a. a pivotal support frame for the saw,

b. a pair of axially spaced main jaws,

c. means connecting the main jaws to the frame and operative to permit the main jaws to move axially relative to each other when the frame is pivoted preparatory to miter cutting,

d. a pair of spaced auxiliary jaws, said auxiliary jaws being movable relative to the main jaws,

e. means slidably connecting each auxiliary jaw to one of the main jaws,

f. spaced parallel jaw caps mounted on the main and auxiliary jaws for holding a metallic section during cutting, each jaw cap interconnecting a main jaw to its slidably connected auxiliary jaw, and

g. means automatically operative to maintain the jaw caps parallel to each other and to the longitudinal axis of the section to be cut when the frame is pivoted preparatory to miter cutting.

3,931,963

FOLDING MACHINES

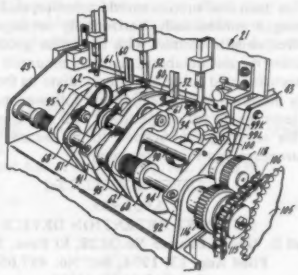
Elmer D. Bewersdorf, Downers Grove, Ill., assignor to McCain Manufacturing Corporation, Chicago, Ill.

Continuation of Ser. No. 385,970, Aug. 6, 1973, abandoned.

This application Mar. 5, 1975, Ser. No. 555,698

Int. Cl.[2] B65H 45/00

U.S. Cl. 270—61 15 Claims



1. A machine for folding the cover of a magazine or the like and feeding the cover to a conveyor located therebeneath, comprising: a supply hopper for supplying sheets constituting the covers to be folded, an opposed pair of rotatable discs presenting a bight between which is fed the sheet to be folded; one of said discs having an unyieldable annulus and the other of said discs having a yieldable annulus opposed thereto whereby the two annuli impart a score line to a sheet fed therebetween; means to feed the sheets one by one to said bight; opposed flights of folder elements beneath the discs for progressively folding the sheet on the score line to form a folded sheet having a backbone; means to invert the scored sheet and deliver it to said opposed flights; and means to crease the backbone along its length to impart a finish fold and to feed the folded sheet to said conveyor.

3,931,964

SHEET FEEDER APPARATUS

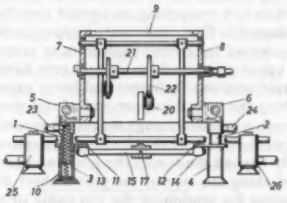
Adolf Schwebel, Offenbach am Main, Germany, assignor to Mabeg Maschinenbau GmbH, Offenbach, Germany

Filed Feb. 19, 1974, Ser. No. 443,820

Claims priority, application Germany, Feb. 23, 1973, 2309013

Int. Cl.[2] B65H 3/40

U.S. Cl. 271—93 9 Claims



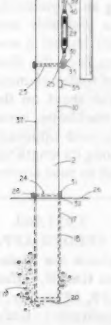
1. A sheet feeder apparatus comprising a frame structure, hollow telescoping suction head means including a stationary support means secured to said frame structure and suction nozzle means movable relative to said support means, first spring means operatively arranged between said support means and nozzle means for normally relatively urging said support means and nozzle means apart, suction means connected to said head means for evacuating said head means while lifting a sheet, said movable nozzle means comprising a guide surface, said apparatus further comprising guide means

pivotally mounted in said frame structure cam means arranged for actuating said guide means, and second spring means urging said guide means simultaneously into cooperating relationship with said cam means and with said guide surface of the nozzle means, whereby said first spring means urges said guide means away from said cam means, and wherein said suction head means comprises two suction heads, the support means of each head comprising a stationary member, the nozzle means of each head comprising a telescoping suction nozzle member, said guide surface comprising a collar guide surface on each said suction nozzle member, said guide means comprising a substantially horizontally arranged guide bar having free ends in contact with the collar guide surfaces of said suction nozzle members, pivotally mounted lever means, means securing said guide bar intermediate its free end to said pivotally mounted lever means, cam follower means secured to said lever means for cooperating with said cam means, and means for securing said second spring means between said frame structure and said lever means.

3,931,965
NET POST RETENTION DEVICE

Marshall D. Grant, Drawer No. 3128, El Paso, Tex. 79923

Filed Aug. 13, 1974, Ser. No. 497,059
Int. Cl.² A63B *61/00*
U.S. Cl. 273—29 BF **6 Claims**

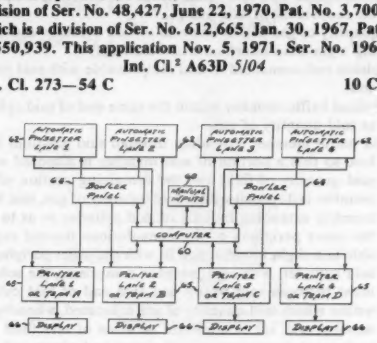


1. A device for positioning and tensioning over a playing surface a vertically hanging game net having at least a top cable having at least one of its ends attached to a stationary point, said device comprising an upright post having a lower portion adapted to fit in a hole and an upper portion extending vertically upward for a height sufficient to accommodate the net; said upper portion of the upright post having means affixed thereto at about the upper and lower extremity thereof for attaching the net; the upper end of said post having disposed therein a recessed trough means for accommodating the top cable of the net to be attached; said trough means extending slightly beyond the top of the post and curving in an arc downward along the side of the post a short distance; turnbuckle means for tensioning the top cable of the net to be attached disposed vertically along the upper portion of said post on the same side thereof as the downward projecting trough means; said turnbuckle means being attached at its lower end to said post and having its upper end adapted for attachment to the top cable of the net to be attached; cover means removably fitted to the upper end and side of said post and adapted to enclose said turnbuckle and trough means to protect players from contact with said turnbuckle and trough means; and stop means affixed to said upright post for maintaining the post at the proper height above ground level.

3,931,966
ELECTRONIC SCORER FOR BOWLING GAMES

Jerome F. Walker, Shaker Heights, Ohio, assignor to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 48,427, June 22, 1970, Pat. No. 3,700,236, which is a division of Ser. No. 612,665, Jan. 30, 1967, Pat. No. 3,550,939. This application Nov. 5, 1971, Ser. No. 196,173
Int. Cl.² A63D *5/04*
U.S. Cl. 273—54 C **10 Claims**

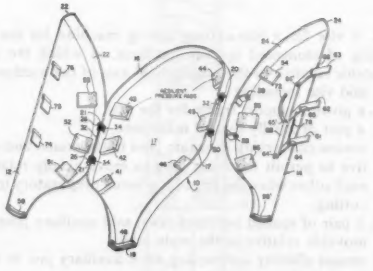


5. In a bowling scoring apparatus for computing the score of a bowler, the combination of: means for detecting pinfall information; means for receiving pinfall information and for computing a bowling score in accordance with the pinfall information; and means connected to said computing means for correcting an inaccurate bowling score computed by said computing means, said correcting means comprising means for entering frame information in said computing means, means for entering cumulative score information in said computing means, means for entering pinfall information in said computing means and means connected to said computing means for initiating an error correction procedure and operable to cause successive corrections to a bowler's score after an initial correction thereto by use of said pinfall entering means and without use of said entry means for frame and cumulative score information.

3,931,967
RACKET COVER AND SUPPORT PRESS

Dianne D. Lyons, Pelican Rock on Cotton Valley Shores, Christiansted, St. Croix, V.I. 00820, and William R. Chandler, 57A Salt River, Christiansted, St. Croix, V.I.

Filed Oct. 7, 1974, Ser. No. 512,728
Int. Cl.² A63B *49/16, 49/18*
U.S. Cl. 273—74 **5 Claims**



1. A combination protective cover and support press for tennis rackets or the like comprising a bottom frame portion having a substantially oval shape with a throat at one end with an upstanding wall except at the end of said throat and being adapted to receive the head of a tennis racket, a pair of top half frame portions, hinge means connecting said pair of top frame portions to said bottom frame portion for movement

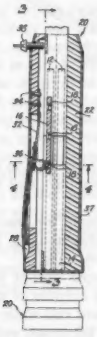
between a closed position overlying said bottom frame portion and an open position exposing said bottom frame portion to permit the insertion of a tennis racket or the like therein and having a substantially half-oval shape with a throat at one end and with an upstanding wall except at the end of said throat and being adapted to contain the head of a tennis racket or the like when said top half frame portions are in said closed position to thereby protect the tennis racket, all of said frame portions being made of a lightweight stiff material, the outer and inner wall surfaces of said top and bottom frames portions being smooth, continuous surfaces unmarred by indentations, resilient means mounted on said inner wall surfaces of said top and bottom frame portions in paired opposed relationship and adapted to exert opposing forces on the frame of a tennis racket positioned therebetween, and means for locking the top half frame portions in closed position, said resilient means including a plurality of resilient pressure pads mounted on said bottom frame portion in spaced-apart relationship near its periphery and on said top half frame portions in an arrangement such that corresponding bottom and top frame pads oppose each other, said pressure pads being distinct entities from said top and bottom frame portions and extending and projecting from their associated frame portions, whereby opposing pads apply a pressing force against each side of the frame of a tennis racket or the like when placed therein to thereby restrict warping.

3,931,968

ADJUSTABLE TENNIS RACKET HANDLE

John K. Hedberg, 4970 Lowell Blvd., Denver, Colo. 80221

Filed May 13, 1974, Ser. No. 469,705
Int. Cl.² A63B *49/08*
U.S. Cl. 273—75 **4 Claims**



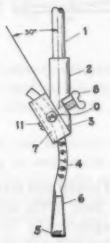
1. A tennis racket having a head and a shank fixed thereto;
a handle slidably mounted on said shank for sliding movement thereon toward and from said head and having a hand-grip portion;
interengageable means on said shank and on said handle for releasably latching said handle in each of a plurality of positions along said shank;
said interengageable means on said handle being movably carried thereby for movement thereon toward and from said shank;
resilient means urging said interengageable means on said handle in a direction outwardly of said handle;
manually interengageable means on said hand-grip portion, adjacent the outer surface thereof, positioned to be engageable by the hand of a player gripping said hand-grip portion and being movable to move said interengageable means on said handle against the urging of said resilient means whereby a player may, by manipulating the hand holding the racket, selectively latch or release said handle relative to said shank; and
said interengageable means on said shank comprising a plurality of longitudinally spaced depressions therein and wherein said interengageable means on said handle comprises a ball engageable in said depressions to latch said handle against movement, said resilient means being an outwardly biased leaf spring secured at one end thereof to said handle and extending adjacent the outer surface thereof, said ball being fixedly mounted on the other end of said spring whereby a firm grip by the player's hand engages said ball into one of said depressions and thereby holds said handle latched to said shank and whereby relaxation of said grip permits said leaf spring to spring outwardly and withdraw said ball from the depression.

3,931,969

ADJUSTABLE GOLF CLUB

Arthur Townhill, 739 Alma Real Drive, Pacific Palisades, Calif. 90272

Filed Apr. 17, 1974, Ser. No. 461,639
Int. Cl.² A63B *53/06*
U.S. Cl. 273—79 **6 Claims**



1. An adjustable golf club for simultaneously adjusting the length, loft, and lie angles of the club thereby being adapted to serve the functions of a set of successively numbered golf clubs wherein these clubs decrease in length and increase in loft and lie angles from the lowest numbered club to the highest numbered club, said adjustable golf club comprising an elongated shaft, a hand grip on one end of the shaft, a fitting on the other end of the shaft having a curved passage therethrough substantially coplanar with the shaft axis and rearwardly directed relative to the shaft, a club head having a striking face, a rear surface, a top surface, a sole surface, a toe end and a heel end, an elongated curved hosel extending from the heel end of the club head upwardly and rearwardly therefrom and defining an acute lie angle and with its curvature being in a plane of curvature inclined relative to a vertical plane perpendicular to the plane of the striking face of the club head, said hosel being slidably mounted in said curved passage of the fitting, means on the fitting for locking the hosel in fixed position in said passage, said hosel length and said curvature of the hosel being such as to simultaneously change the effective length of the club, the lie angle of the sole relative to the axis of the shaft and the loft angle of the striking face of the club head to reproduce the club lengths, lie angles, and loft angles of said set of golf clubs when said fitting is locked to the hosel in the appropriate position.

3,931,970

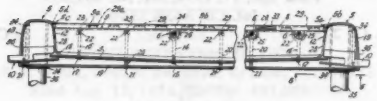
PLASTIC GAME BOARD HAVING A UNITARY FRAME

Claudio Cecchetti, Milan, Italy, assignor to Arco Faic srl, Milan, Italy

Continuation of Ser. No. 432,864, Jan. 14, 1974, abandoned. This application Apr. 23, 1975, Ser. No. 570,594
Int. Cl.² A63F *7/06*
U.S. Cl. 273—85 D **8 Claims**

1. A game board adapted for use with a movable game piece comprising a playing surface board, a generally rectangular

unitary plastic frame having opposed side sections and opposed end sections providing a walled element around said playing field board for substantially confining the game piece thereon, said plastic frame having a generally inverted U-shaped cross-section and comprising downwardly spaced inner and outer walls connected by a top surface, the base of said inner wall generally defining a rectangle and being connected adjacent the base to said playing field board whereby said inner wall extends above said playing field board to provide a walled element around said playing field board for substantially confining the game piece thereon, and the base of said outer wall extending below the base of said inner wall and generally defining a larger rectangle and being connected adjacent the base to a base board which extends on a plane



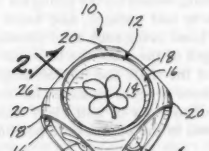
beneath the playing field board and serves as the bottom cover for the game board, the base of the inner wall of each of said side sections being longitudinally inclined from each end section downwardly to the center of each side section whereby the attachment of said playing field board adjacent the base of said inner wall causes said playing field board to be inclined downwardly from each end section to the center of each side section, such inclination adapted to cause a free moving game piece to move to the center of the surface of the playing field board and said inner wall being downwardly and inwardly inclined, adjacent its base, to the surface of the playing field board in order to increase the area of contact playing field board and to provide means for deflecting the game piece during play.

3,931,971

PROJECTILE HAVING INDENTED SURFACE AREAS

Bobbie S. Harvey, R.R. 1 on Island, Tracy, Iowa

Filed May 10, 1974, Ser. No. 468,912
Int. Cl.² A63F 3/00
U.S. Cl. 273—106 R **6 Claims**



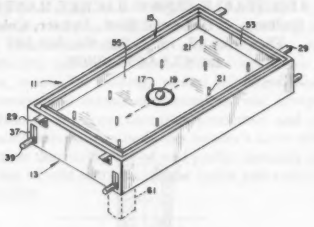
1. An amusement device comprising:
a body member having a substantially spherical shape with six equally-sized indentations formed thereon;
each of said indentations comprising an annular rim, tapered side walls extending inwardly from said annular rim and a flat circular surface positioned radially inwardly from said annular rim,
said body member having a spherical surface between said annular rims;
a plurality of raised indicia being on said flat circular surfaces, said raised indicia having a height less than the distance between said rims and said flat circular surfaces whereby said rims prevent said indicia from interfering with rolling of said body member on a flat surface;
a dimple formed in said spherical surface, said dimple being concave and being substantially smaller than said indentations so that the statistical chances of said body coming to rest on said dimple are smaller than the chances of coming to rest on one of said indentations.

3,931,972

TILTABLE SURFACE GAME TOY

James M. Fabian, St. Clair Shores, Mich., assignor to Victor M. Fabian and Leo Garr, both of Detroit, Mich., part interest to each

Filed Apr. 2, 1975, Ser. No. 564,281
Int. Cl.² A63F 7/16
U.S. Cl. 273—110 **10 Claims**



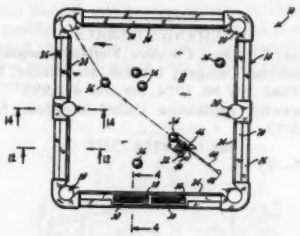
1. In a tiltable surface game toy, an open top housing assembly mountable upon a support and including side, end and bottom walls;
a universally tiltable open top insert assembly loosely disposed within the said housing assembly and including side, end and bottom walls;
a pair of upright spaced corner guides secured adjacent each of the internal corners of said housing assembly to its respective side and end walls;
a vertically adjustable lift means guidably mounted between said corners and guides respectively;
outwardly extending arm means secured to each said lift means projecting outwardly through a coresponding upright slot in the end walls of the housing assembly and terminating in a handle;
said lift means supportably engaging the undersurface of said insert assembly at the corners thereof, whereby selective manual vertical adjustments of one or more of said lift means are adapted to angularly tilt the bottom wall of the insert assembly to any resultant angle with respect to a horizontal plane throughout 360°, selectively;
there being game board indicia upon said insert assembly bottom wall;
a series of variably spaced targets or obstacles mounted on said indicia;
and a ball initially disposed on said indicia, movably thereover in various directions relative to the insert assembly walls, depending upon the resultant tilt of said insert assembly bottom wall, so as to strike or not strike said targets.

3,931,973

POCKETED GAME BOARD WITH MOVABLE BALL-PROPELLING MECHANISM

Walter Moe, Huntington, N.Y., assignor to Aurora Products Corporation, West Hempstead, N.Y.

Filed Jan. 23, 1974, Ser. No. 435,961
Int. Cl.² A63F 7/10; A63D 3/02
U.S. Cl. 273—123 R 4 Claims



1. A game of skill comprising a plurality of playing balls, a game board having ball-receiving pockets formed therein adapted to receive said playing balls, a ball-propelling mechanism including a movable stand movable about said game board for propelling said playing balls into said ball-receiving pockets, said movable stand including a base, an upstanding support and an impact member, said impact member being pivotally mounted at one end thereof to said upstanding support, the other end of said impact member being free to swing through an arc having its axis formed by the axis of the pivotal mounting of said one end of said impact member with said upstanding support, said impact member being so mounted to said support as to pivot in one predetermined plane only, relative to said support, said base including at least one ball-receiving recess formed in said base, said recess being formed as an indentation in the edge of said base, said indentation being so structured that one of said playing balls when resting on the game board may be inserted therein by moving said indentation thereagainst, said one of said playing balls, when so inserted, being positioned for impact by said impact member, and when so inserted, being free of contact with said impact member except at the moment of said impact, said recess being so aligned with said impact member such that whenever said one of said playing balls is received therein, the center line of said one of said playing balls is in alignment with said predetermined plane, whereby said playing ball is projected in a direction parallel to, and coincident to, said predetermined plane.

3,931,974

AIR TABLE GAME APPARATUS

Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91356, and Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316

Filed Feb. 15, 1974, Ser. No. 443,110
Int. Cl.² A63F 3/00
U.S. Cl. 273—126 R 15 Claims

1. A game apparatus capable of generating an air bearing surface for supporting a movable playing piece thereon by an air cushion, said apparatus comprising:

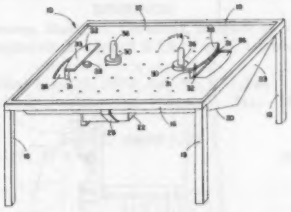
a. generally flat, relatively rigid, relatively horizontally disposed member having an upper surface defining a playing surface,

b. means defining a plurality of apertures in said relatively horizontally disposed member capable of emitting air under pressure therethrough,

c. a supporting structure retaining said relatively horizontally disposed member in upwardly spaced relationship to a floor or other supporting surface,

d. an upstanding lip extending upwardly from said playing surface and around the periphery of said relatively horizontally disposed member,

e. a flexible plastic member of substantially greater pliability than said relatively rigid member located beneath said relatively horizontally disposed member and extending across the entire lower surface of said relatively horizontally disposed member and being secured with respect thereto to form an air chamber between said flexible member and said relatively horizontally disposed member so that air may be emitted through said apertures,



f. an air pump operatively retained on said apparatus for pumping air into said air chamber and is supported in upwardly spaced relationship to a floor or other supporting surface,

g. a flexible strap means secured to said supporting structure and engaging an underside of said air pump to hold said air pump in said upwardly spaced relationship to said floor or other supporting structure and so that vibrational forces are not transmitted to said flexible plastic member,

h. a fitting secured to said plastic member, and

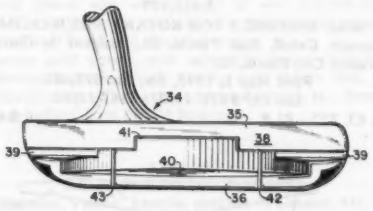
i. a tube connected to said air pump and to said fitting for delivery of air under pressure from said pump to said air chamber.

3,931,975

GOLF CLUB

Raymon W. Cook, 406 Top Hill, San Antonio, Tex. 78209

Division of Ser. No. 867,107, Sept. 10, 1969, Pat. No. 3,884,468. This application Aug. 12, 1974, Ser. No. 496,451
Int. Cl.² A63B 53/04
U.S. Cl. 273—164 12 Claims

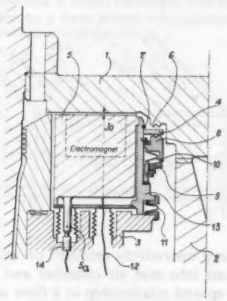


1. In a golf club head consisting of an upstanding blade having a front face and a rear face with a flange extending rearwardly of the said blade, said flange having a top, a rear face and sole, a longitudinally and horizontally extending groove in the rear face of said blade extending completely across the rear face thereof, a flange groove extending downwardly into the top of said flange to an approximate uniform depth and terminating rearwardly substantially across the entire rear face of said flange, said flange groove communicating with said longitudinally and horizontally extending groove, first and second spaced and parallel alignment grooves in said flange groove, said alignment grooves being disposed transverse to the longitudinal axis of said club head and extending upwardly into said blade.

3,931,976
MAGNETICALLY CONTROLLED OBTURATOR

Claude Duquenne, La Garenne, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Oct. 15, 1974, Ser. No. 514,996
Claims priority, application France, Oct. 19, 1973, 73.37308
Int. Cl.² F16J 9/00
U.S. Cl. 277—80 7 Claims

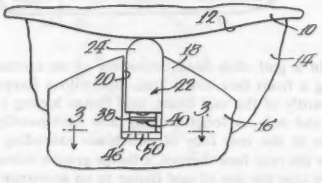


1. An obturator for the rotor of a rotating machine which conveys a noxious fluid, said obturator being constituted by an annular seal located in a plane at right angles to the axis of rotation of the machine, said seal being clamped in the active position between on the one hand stationary knife-edge elements provided for this purpose on the rotor and on the other hand movable knife-edge elements carried by an annular supporting member which is capable of moving along the axis of the machine under the action of magnetic means between an active position in which said supporting member is held at a distance from the rotor and an active position in which said member is coupled with said rotor by means of magnetic attraction forces, wherein the movable knife-edge elements are connected to the movable support member by resilient means whereby an obturation force of lower value than the magnetic attraction force is exerted in the direction of the stationary knife-edge elements.

3,931,977
SEAL ASSEMBLY FOR ROTARY MECHANISMS

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 1, 1975, Ser. No. 573,681
Int. Cl.² F01C 19/02; F16J 15/24
U.S. Cl. 277—81 P 8 Claims

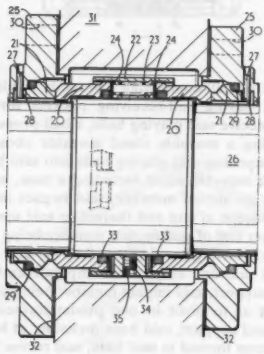


1. In a rotary mechanism having means defining an operating chamber, a rotor within said chamber, at least one seal receiving groove in said rotor, and sealing means in said groove; the improvement wherein said sealing means comprises a unitized seal assembly disposed within said groove and including a seal extending partially out of said groove to sealingly engage a wall of said operating chamber, spring means secured to said seal for biasing said seal into said sealing engagement, and a carrier element in said groove and secured to said spring means, said carrier element including resilient means having an unstressed width slightly greater than the width of said groove, whereby when said carrier element is disposed within said groove, said resilient means will grip said groove to positively retain said unitized seal assembly within said groove.

3,931,978
MECHANICAL SEALS

Roger Anthony Grimston, Cheshire, England, assignor to Burmah Engineering Company Limited, Manchester, England

Filed July 30, 1974, Ser. No. 492,995
Claims priority, application United Kingdom, Sept. 26, 1973, 45053/73
Int. Cl.² F16J 15/34
U.S. Cl. 277—93 5 Claims



1. A mechanical seal comprising:
a. at least one stationary seal member;
b. a rotatable spring carrier ring having a plurality of angularly spaced, T-shaped dimples about its inner surface adjacent at least one edge;
c. at least one rotatable annular seal member having a plurality of angularly spaced, peripheral flange segments defining slots therebetween, said slots dimensioned so as to pass over said T-shaped dimples of said spring carrier ring while angular displacement of the rotatable seal member with respect to the spring carrier ring causes the flange segments to engage the T-shaped dimples thereby attaching said at least one rotatable seal member to said spring carrier ring;
d. at least one pressure plate disposed within said spring carrier ring and bearing against the rotatable seal member; and
e. at least one spring means disposed within said spring carrier ring and bearing against the at least one pressure plate so as to urge the rotatable seal member against the stationary seal member.

3,931,979
DEVICE FOR CLAMPING TOGETHER TWO MACHINE MEMBERS HAVING MATING CENTERING MEANS

Rene Poincenot, 32 Avenue Bosquet, Paris, France (75007)

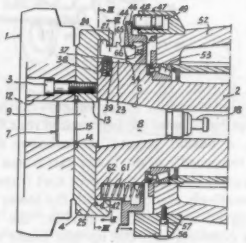
Filed Apr. 26, 1974, Ser. No. 465,170
Claims priority, application France, May 17, 1973, 73.17851
Int. Cl.² B23B 5/22, 31/12
U.S. Cl. 279—107 2 Claims

1. In an assembly of two coaxial members having mutual mating centering means, a clamping device comprising:

a plurality of dogs arranged on a first of said two members, each said dog having a hook-portion and being T-shaped with a middle leg having a distal end and with a transverse branch having two short faces, said middle leg assuming a position in a direction substantially axial, said hook portion being located at the distal end of said middle leg,

means mounting said dogs for rocking movement in radial planes on said first member,

a transverse groove in the second of said members, said groove having a front face, said dogs being adapted to assume through said rocking movement either an operative position in which said hook-portions of said dogs are engaged against said front face of said groove or an inoperative position in which they are positioned out of said groove,



axial retaining means carried by each dog and constituted by said short faces of said transverse branch,

mating axial retaining means carried by said first member and adapted to cooperate with said axial retaining means carried by said dogs, said mating axial retaining means being constituted by front supporting faces mating with said short faces,

cam portions carried by said dogs,

an annular operating part axially shiftable on one of said two members,

and mating cam portions carried by said annular operating part and mating with said cam portions carried by said dogs for cooperating therewith so as to actuate said dogs upon axial shifting movement of said annular operating part.

3,931,980

SAFETY SKI BINDING SYSTEM

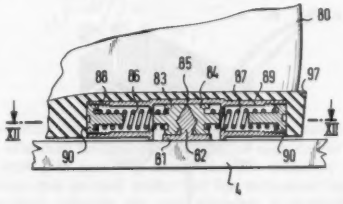
Hannes Marker, Garmisch-Partenkirchen, Germany

Division of Ser. No. 142,144, May 11, 1971, Pat. No. 3,785,668. This application June 28, 1973, Ser. No. 374,498

Claims priority, application Germany, May 12, 1970, 2023169; Nov. 11, 1970, 2055499

Int. Cl.² A03C 9/08

U.S. Cl. 280—11.35 R **4 Claims**



1. A safety ski binding system comprising a disc-shaped abutment mounted on a ski in a position adapted to be approximately coaxial to the tibia of the skier, a skiing boot having a recess in a sole thereof, a hood including at least one resilient clamp member, said hood and abutment being adapted to extend into said recess in the sole of said skiing boot, said abutment carrying an upstanding detent pin adapted to interlock with said at least one resilient clamp member, and locking means for securing said hood to said skiing boot so that said hood can be only arbitrarily unlocked, said hood adapted to cooperate with the sole of said skiing boot to force said sole against said abutment and to release said boot in response to a predetermined overload force.

3,931,981

ADJUSTABLE JAW, ESPECIALLY FRONT JAW, FOR SKI BINDINGS

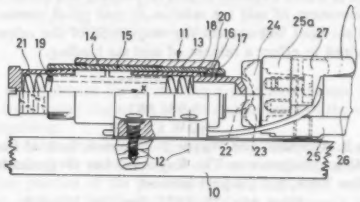
Brigitte Sittmann, Stuttgart, Germany, assignor to Vereinigte Baubeschlagfabriken Gretsch & Co. GmbH, Leonberg, Germany

Filed May 20, 1974, Ser. No. 471,544

Claims priority, application Germany, May 25, 1973, 2326636

Int. Cl.² A63C 9/08

U.S. Cl. 280—11.35 T **29 Claims**



1. An adjustable retaining jaw for releasably connecting first and second relatively movable ski binding parts to one another, comprising:

a housing,

housing connecting means for connecting said housing to said first part,

a detent unit carried by said housing, said detent unit including a detent means engageable with counter-detent means at said second part and detent biasing means for biasing said detent means against said counter-detent means,

and detent unit adjusting means for adjusting the position of said detent unit with respect to said counter-detent means, said detent unit adjusting means being separate from said housing connecting means,

wherein said detent unit adjusting means includes a threaded sleeve which carries said detent unit, said threaded sleeve being threadably adjustable in a threaded longitudinal bore of said housing.

3,931,982

RELEASE BINDING FOR SKIS

Axel Kubelka, Vienna, Austria, assignor to Gertsch AG, Zug, Switzerland

Filed June 6, 1974, Ser. No. 476,878

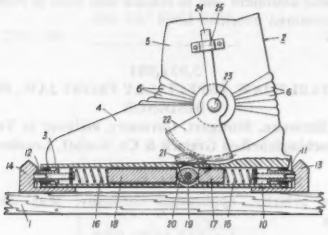
Claims priority, application Austria, June 7, 1973, 4999/73

Int. Cl.² A63C 9/086

U.S. Cl. 280—11.35 D **13 Claims**

1. A release ski binding, comprising: holding means for one of the heel and the toe of the ski boot, said holding means including a holding spring and a locking member operatively associated with said ski boot and biased by said holding spring into a releasable engagement with an abutment means mounted on a ski, the engagement of said locking member with said abutment means holding said ski boot to said ski, transfer means pivotally connected to said ski boot, the leg of the skier being operatively connected to move said transfer means, said transfer means including control means coupled

with at least one of said abutment means and said holding spring for varying the magnitude of force required to effect a release of said ski binding in response to a movement of said leg relative to said pivot connection to thereby control the



force at which a release of said ski binding will occur, whereby a movement of said leg relative to said pivot connection on said ski boot will control the magnitude of the release force required to effect a release of said ski binding.

3,931,983

SNOW CYCLE

Roy E. Kanouse, and Wayne F. Kanouse, both of Ludington, Mich., assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Aug. 28, 1972, Ser. No. 284,438
Int. Cl.² B62B 19/04
U.S. Cl. 280—12.14 1 Claim

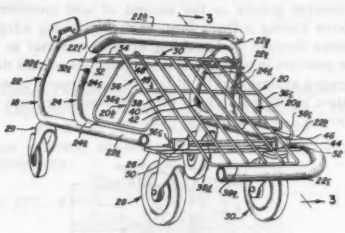
1. A snow cycle comprising:
a tricycle frame with seat, handle bar steering, and foot pedal operated chain drive, said bar steering employing a downwardly inclined shaft;
a leaf spring secured to the bottom of said shaft;
a ski;
said spring being secured to the top surface of said ski;
a horizontal axle extending rotatably through the rear of the frame at right angles thereto;
means connecting said drive to said axle to cause rotation of the same; and
drum means disposed around said axle as a horizontal axis, said drum means rotating with said axle;
said drum means including like cylinders disposed end to end in spaced position and having said axis in common;
each of said cylinders having cleats on the outer surface for preventing slippage in snow and ice; and
said cylinders being hollow and open at both ends and secured to said axis by spokes.

3,931,984

ANTI-LOADING TRAY FOR SHOPPING CARTS

Norman Young, Oklahoma City, Okla., assignor to Unarco Industries, Inc., Chicago, Ill.

Filed July 15, 1974, Ser. No. 488,730
Int. Cl.² B62B 11/00
U.S. Cl. 280—33.99 C 5 Claims



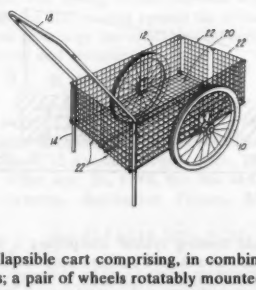
1. In a wheeled nestable shopping cart of the type which includes a lower cart frame having toe and rear ends joined by side portions, a basket spaced thereabove, upright brace means spaced rearwardly of the lower cart frame's toe end and extending upwardly between the lower cart frame and basket, and means operatively associated with the lower cart frame to prevent loading of merchandise thereon, the improvement comprising, in combination, the upright brace means having a portion inclining forwardly and upwardly from said lower frame toward said basket, the lower cart frame including a transverse member adjacent the toe end of the cart, said means to prevent loading including a lower tray sub-assembly arranged to be selectively and nonpermanently attached to the cart and providing an upper surface extending substantially between said lower cart frame and said basket at an angle relative to the horizontal such as to prevent storage of articles thereon, the lower tray sub-assembly having rearward and forward elements arranged respectively to lie above and against the forwardly inclined portion of the brace means and said transverse member of the lower cart frame, and hook means adjacent the toe end of the lower cart frame arranged for restraining a portion of the lower tray sub-assembly for limiting rearward and upward movement of said lower tray, the hook means restraining an intermediate portion of the lower tray between said rearward and forward elements to maintain said rearward and forward elements against their respective supports.

3,931,985

COLLAPSIBLE CART

Eric Knebel, 5147 Burlingame Drive, Atlanta, Ga. 30340

Filed Dec. 2, 1974, Ser. No. 528,771
Int. Cl.² B62B 11/00
U.S. Cl. 280—42 13 Claims



1. A collapsible cart comprising, in combination, a pair of side panels; a pair of wheels rotatably mounted to said pair of side panels; a pair of bottom panels hinged together and to

said pair of side panels; a first pair of end panels hinged together and to first adjacent ends of said pair of side panels; and a second pair of end panels hinged together and to second adjacent ends of said pair of side panels opposite said first adjacent ends.

3,931,986

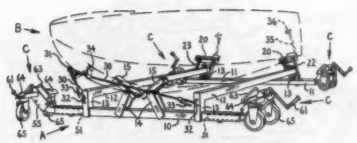
REMOVABLE JACKING WHEEL UNIT

Louis A. Hunziker, 783 Commerce Ave., Longview, Wash. 98632

Division of Ser. No. 407,988, Oct. 19, 1973, Pat. No. 3,880,310. This application Dec. 13, 1974, Ser. No. 532,369

Int. Cl.² B60P 1/02

U.S. Cl. 280—43.2 5 Claims



1. A wheel unit for detachable connection with a frame structure having outwardly directed horizontal tubular sockets, said unit comprising a rigid angular arm having a horizontal end portion and an upwardly extending opposite end portion, said horizontal end portion being adapted to slide into and out of said sockets, a jack housing surrounding and slidable upward and downward on said upwardly extending end portion of said arm, caster wheels on said jack housing for supporting said unit on a floor, and jack means in said housing for moving said upwardly extending portion of said arm relative to said housing for raising and lowering said horizontal end portion of said arm in a range of movement between substantially floor level and an elevated position.

3,931,987

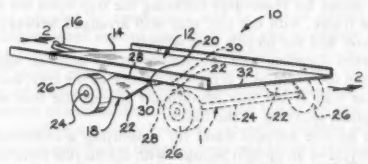
TRAILER WITH MOVEABLE AXLE ASSEMBLY

Robert G. Holliday, 4517 S. Zeeb Road, Ann Arbor, Mich. 48103

Filed Mar. 24, 1975, Ser. No. 561,497

Int. Cl.² B62D 27/04

U.S. Cl. 280—80 B 10 Claims



1. A trailer comprising a trailer bed, an axle assembly having an axle shaft and wheels journaled at each end of the axle shaft, said axle assembly being pivotally mounted about a transverse axis on said trailer bed for movement between a first position wherein the axle assembly is forward of the pivotal mounting so that the wheels are located under and substantially midway of the length of the trailer bed and a second position wherein the axle assembly is rearward of the pivotal mounting so that the wheels are located under and adjacent to the rear end of the trailer bed.

3,931,988

VEHICLE SAFETY DEVICE

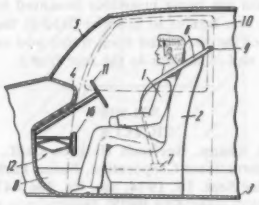
Klaus Oehm, Wolfsburg; Ulrich Seiffert, Braunschweig; Burckhard Strilwe, Fallersleben; Ernst Fiala, Wolfsburg; Andreas Bauer; Ruediger Weissner, both of Fallersleben, and Wilfried Schwanz, Ahnsen, all of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Sept. 28, 1973, Ser. No. 401,680

Claims priority, application Germany, Sept. 28, 1972, 2248003

Int. Cl.² B60R 21/10

U.S. Cl. 280—150 B 2 Claims



1. A safety device for protecting a passenger seated in a vehicle from injury during an abrupt deceleration of the vehicle, comprising:

a. a shoulder belt extending diagonally across the upper portion of the passenger's body for restraining only the upper portion of the passenger's body against a vehicle seat, whereby the lower portion of the passenger's body is left free to slide forward; and

b. energy absorbing means disposed on the vehicle in a zone in the passenger compartment forward of the knees of the seated passenger for restraining the lower portion of the passenger's body sliding forward during abrupt deceleration of the vehicle, by means of the passenger's knees impacting against said energy absorbing means, in conjunction with the operation of said shoulder belt restraining the upper portion of the passenger's body.

3,931,989

CONNECTING DEVICE FOR FRONT AND REAR FRAME OF TRICYCLE

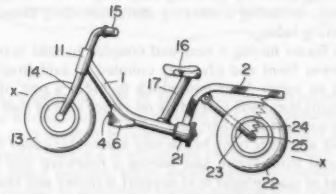
Toshiaki Nagamitsu, Ikeda, Japan, assignor to Daihatsu Motor Company Limited, Osaka, Japan

Filed June 10, 1974, Ser. No. 478,087

Claims priority, application Japan, June 18, 1973, 48-68916; June 18, 1973, 48-72516

Int. Cl.² B62K 5/06

U.S. Cl. 280—283 11 Claims



1. A connecting device for a front and a rear frame of a tricycle wherein the front frame has a front wheel, a handle bar for steering said wheel and a saddle for a rider, and the rear frame has two rear wheels, said connecting device comprising

a tubular shaft fixed to one of opposite ends of said front and rear frames;

a boss member, of cylindrical shape, fixed to the other of said opposite ends;

radial bearings insertably mounted within said boss member so as to hold said tubular shaft therewith,

said tubular shaft, radial bearing and boss member similarly having an axis extending longitudinally of the tricycle body,

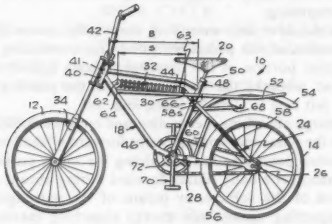
said front frame being inclined around the axis to one side or the other enabling a rider to lean when a turn is made; and

a torsion bar extending through said tubular shaft at the center thereof and positioned coincident with said axis, said torsion bar being insertably mounted between said front and rear frames so as to be fixed at the lengthwise fore end of the bar to the front frame and at the lengthwise rear end of the bar to the rear frame.

3,931,990
BICYCLE

Ronald Ralph Knapp, Hacienda Heights, Calif., assignor to Yamaha International Corporation, Buena Park, Calif.

Filed Sept. 16, 1974, Ser. No. 506,447
Int. Cl.² B62K *25/04*
U.S. Cl. 280—283 **7 Claims**



1. A bicycle comprising:

front and rear wheels;

a front frame having a forward end forming a steering tube, a substantially horizontal upper member extending rearwardly from said steering tube, a diagonal member extending rearwardly and downwardly from said steering tube, and a tubular seat-support member coupling rearward portions of said upper and diagonal members;

a seat assembly including a seat shaft received in said tubular seat-supported member and a seat at the top of said seat shaft;

a pedal assembly rotatably connected to said front frame near the rearward end of said diagonal member thereof;

a steering assembly coupling said front frame to said front wheel, including a steering shaft extending through said steering tube;

a rear frame having a rear end coupled to said rear wheel, a lower front end pivotally coupled to said front frame, and an upper front end which includes a pair of shock-support members extending on either side of said tubular seat-support member; and

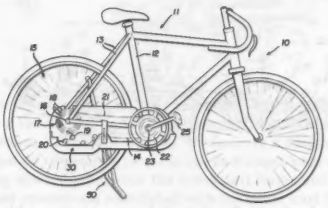
a shock absorber lying below said horizontal upper member of said front frame and having a rearward end lying in front of said tubular seat-support member and coupled to the forward ends of said shock-support members, said shock absorber extending substantially horizontally and parallel to said upper member and having a front end lying immediately behind said steering tube so that the length of the shock absorber is at least two-thirds the maximum length of space between said steering tube and seat-support member of said front frame;

the front and rear ends of said shock absorber being pivotally connected respectively to said front frame and to said shock-support members of said rear frame, and said shock absorber being free of confinement by either of said frames between the pivotally connected ends of said shock absorber.

3,931,991
BICYCLE CHAIN CLEANING TRAY

John L. Marchello, Box 100, 57751 Grand River Ave., New Hudson, Mich. 48165

Filed May 9, 1975, Ser. No. 576,039
Int. Cl.² B62J *31/00;* **B62H** *3/10;* **B25H** *1/00;* **F16H** *57/05*
U.S. Cl. 280—295 **11 Claims**



1. A cleaning tray for use in cleaning a drive chain of a bicycle of the type having a frame carrying a rear wheel with a hub upon which at least one sprocket-type gear is mounted at one side of the wheel and having a pedal crank mounted upon the frame at a distance forwardly of the wheel hub, with at least one sprocket type drive gear mounted upon the pedal crank and generally aligned with the wheel hub gear, and an endless flexible drive chain normally passing around and interconnecting the drive gear with the hub gear, said tray comprising:

a narrow, horizontally extending bottom and roughly vertical rear and front walls and opposite end closure portions all joined together to form a horizontally elongated, narrow, open top, box-like shape, but with the rear wall being considerably higher than the front wall;

a pair of spaced apart, vertically elongated, open upper end slots formed in the rear wall and shaped to respectively receive the hub portion adjacent the bicycle hub gear and the crank portion adjacent the drive gear so that said gears fit within the tray between the planes of the tray front and rear walls, and the bicycle chain is arranged within the tray, i.e., in a plane located between the tray front and rear walls;

and means for removably fastening the tray upon the bicycle frame, with the tray rear wall arranged between the chain and the bicycle rear wheel;

whereby cleaning and lubricating fluids may be applied upon the chain as it is moved relative to the tray, and the rear wall of the tray additionally shields the rear wheel against spraying of the fluids.

7. A bicycle support stand for supporting a conventional type bicycle in an upright position with the bicycle front wheel rested upon and the rear wheel elevated above the support floor, comprising:

a pair of thin, narrow, elongated, substantially rigid strips having adjacent edge portions overlapped and secured together face-to-face to form an upper end portion;

and the strips diverging downwardly from said upper end portion in a roughly inverted V-shape configuration to form diverging legs;

with the strips at the lower ends of said legs extending horizontally in the same direction to form horizontal portions, with one of the strip horizontal portions closing the space between the lower ends of the legs and being overlapped by the other strip horizontal portion and

secured thereto to form a horizontal floor engaging extension portion;

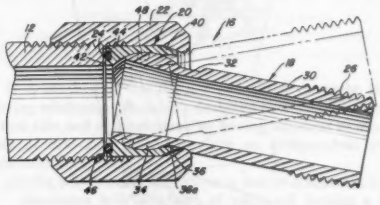
and releasible clamp means mounted upon said upper end portion for manual clamping upon an adjacent bicycle frame element, so that the legs are positioned adjacent one side of the bicycle, and the horizontal extension portion is rested upon the support floor and extends transversely beneath the bicycle.

3,931,992

UNIVERSAL JOINT CONNECTOR

Joseph B. Coel, Menomonee Falls, Wis., assignor to Badger Meter, Inc., Milwaukee, Wis.

Filed Nov. 30, 1973, Ser. No. 420,619
Int. Cl.² F16L 27/06
U.S. Cl. 285—30 18 Claims



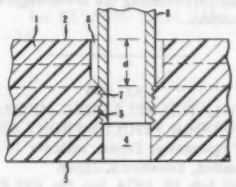
1. A plumbing connector assembly for providing a sealed universal joint connection with one end of a fluid conduit, comprising: a tubular tail piece having an end section formed with a rounded exterior surface, and a further portion of substantially lesser diameter than said end section and which extends from said end section; a socket member formed with an internal passage therethrough and which is of a configuration to receive said rounded end section of said tail piece within said socket member through one end of said passage; said socket member including means for preventing passage of said rounded end section through the other end of said member, an annular end disposed axially outward of said means at said other end thereof, and a body portion extending from said annular end and including an annular flexible sealing portion axially located to be circumjacent a portion of said rounded section between the outermost diameter portion of said rounded section and said further portion of said tail piece when said rounded section is seated in said socket member against said means, said body portion being of sufficient rigidity to transmit axial compressive forces from said sealing portion to said annular end; sealing means on said annular end of said socket member for sealing abutment engagement with the end surface of such a fluid conduit; and a connector element adapted to encompass and be moved axially of said socket member toward said other end and to engage an adjacent end portion of such a fluid conduit; said connector and said socket member being of internal diameters at said one end of said socket member substantially greater than the diameter of said further portion of said tail piece; said connector including a radially inwardly extending portion positioned to engage said socket member over said sealing portion as said connector is moved axially along said socket member toward said other end, and said engaging portions of said connector and said socket member being of configurations providing a cam engagement therebetween oriented to urge said socket member axially toward a connected fluid conduit at said other end and thereby to effect sealing engagement of said sealing means with such a fluid conduit and simultaneously to compress said annular sealing portion of said socket member radially inward into sealing engagement with said rounded section in the course of engagement of said connector on such a fluid conduit, whereby sealed joints are formed between said socket member and both said fluid conduit and said rounded section to provide a fluid-tight connection between said tail piece and said conduit in any of various angular positions of said tail piece relative to such a connected conduit and said connector member does not engage said rounded end section in forming said sealed joint.

3,931,993

FORCE RESISTANT ASSEMBLY

Steven Andrew Cope, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed May 31, 1974, Ser. No. 476,136
Int. Cl.² F16L 5/00
U.S. Cl. 285—200 4 Claims



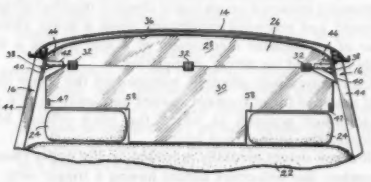
1. In the combination of (a) a sheet of organic polymeric material having a first and second side and reinforced therebetween with layered fibrous material aligned substantially parallel to the sides of the sheet, the sheet having a passageway formed therein, all the walls of the passageway being integral with and of the same composition as the remainder of the sheet material and formed directly in the sheet and having female threads formed therein extending less than the thickness of the sheet, and (b) a male-threaded element secured in the passageway from the first side of the sheet by engagement of the male threads with the female threads in the passageway, the improvement wherein the engaged male and female threads nearest to the first side are a distance from the first side which is at least equal to 10 percent of the depth of engaged threads and not less than 2 millimeters.

3,931,994

DIVIDER FOR USE IN THE OCCUPANT COMPARTMENT OF VEHICLE

James A. Palmiter, 520 N. Bluff St., Berrien Springs, Mich. 49103

Filed Sept. 16, 1974, Ser. No. 505,975
Int. Cl.² B62D 33/06
U.S. Cl. 296—24 R 5 Claims



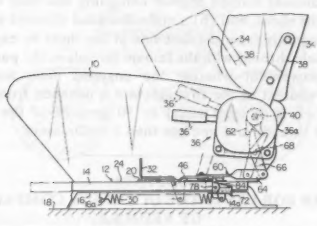
1. A divider for use in the occupant compartment of a vehicle having a roof, spaced sides and an occupant seat with a back rest located between said sides and under said roof, said divider having a lower planar panel portion and an upper planar panel portion, hinge means pivotally connecting said lower portion to said upper portion wherein said lower portion is shiftable about the hinge means between a closed position in general alignment with said upper portion and an open position extending generally normally to the upper portion, said divider adapted to extend transversely of said vehicle from one side to the other side above the back rest of said seat, said upper portion and said lower portion when in its closed

position adapted to extend between said vehicle roof and seat back rest, and means for securing said upper portion to said vehicle to enable said lower portion to shift between its closed position in which said upper and lower portions will extend extensively between said roof and seat back rest and its open position in which an open space will exist between said upper portion and seat back rest, said lower portion including means for securing said lower portion in its upper position to said vehicle, said upper portion including integral planar extensions, each extension having an upper edge and a lower edge, each upper edge generally conforming to the inside configuration of said roof and defining opposite end parts, said upper portion securing means including a pair of brackets each having a channel part cradling the lower edge of an end part of said upper portion.

3,931,995
TEMPORARY LATCH RELEASING MECHANISM FOR TWO DOOR VEHICLE FRONT SEAT

Tomiji Arai, Tokorozawa, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed July 19, 1974, Ser. No. 489,895
Claims priority, application Japan, July 23, 1973, 48-80981
Int. Cl.² B60N *1/04*
U.S. Cl. 297—341 **7 Claims**



1. A temporary latch releasing mechanism for a springurged latch pivotally mounted on an upper channel member adapted for forward and rearward movement along a lower channel member of an adjuster mechanism of a seat having a back pivotally mounted for tilting, comprising:

a latch release blade pivotally mounted on the upper channel member for movement toward and away from a predetermined position at which the latch release blade releases the springurged latch;

a bell-crank detent pivotally mounted on the upper channel member, the bell-crank detent having a trigger arm;

operating means for moving, upon movement of the back when the back is tilted forward, the latch release blade to the predetermined position;

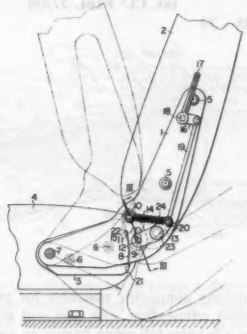
means biasing the bell-crank detent in a predetermined direction to lock the latch release blade in the predetermined position when the latch release blade is moved to the predetermined position and the latch release blade away from the predetermined position; and

detent release means for moving the trigger arm in an opposite direction to the predetermined direction to unlock the latch release blade when the trigger arm is moved by the detent release as a result of rearward movement of the upper channel member relative to the lower channel member.

3,931,996
ADJUSTABLE HINGE FITTING FOR A SEAT WITH A MOVABLE BACK

Noboru Yoshimura, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 212,960, Dec. 28, 1971, abandoned. This application Nov. 19, 1973, Ser. No. 417,048
Claims priority, application Japan, Dec. 28, 1970, 45-127941
Int. Cl.² A47C *1/00*
U.S. Cl. 297—366 **7 Claims**



1. A two-part hinge fitting for adjustably connecting a seat and a back rest, especially for motor vehicles, comprising, in combination:

a first arm provided with an arcuate series of teeth at one edge and being secured to either one of the seat and back rest;

a second arm pivoted at one end to said first arm and being secured to the other one of the seat and back rest;

a pawl pivoted to said second arm and having a cam groove therein and being provided with a series of teeth for engaging the arcuate series of teeth on said first arm;

a control means operatively connected to the pawl through a pin freely slidable in said cam groove thereof for governing engagement thereof with the arcuate series of teeth on said first arm;

manually operative handle means pivoted on said second arm and being operatively connected to said control means; and

spring means anchored at one end thereof to a pin which pivotally connects said pawl to said second arm and at the other end to said control means;

said first arm being formed with non-toothed portions at both ends of the arcuate series of teeth thereon and being of a radius of curvature concentric to the center of rotation of said second arm, said radius of curvature being slightly greater than the distance from the center of rotation of said second arm to the apex of any one tooth of the series of teeth on said first arm, whereby the pawl may be smoothly and safely disengaged from the series of teeth on said first arm with at least the outermost one of the teeth of said pawl riding over one of said non-toothed portions, and hence, the back rest may be tilted through a large angle forwardly and backwardly beyond the normal range of adjustment to a folded down position and a fully reclined position, respectively; and

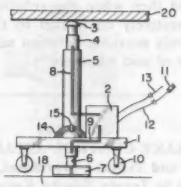
characterized by the fact that said second arm is so pivoted to the first arm that the pivoting pin thereof is positioned away from the rear edge of said seat.

3,931,997

METHOD FOR BREAKING CONCRETE STRUCTURES

Akira Enami, Tokyo, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 395,157, Sept. 7, 1973, abandoned.
This application May 28, 1975, Ser. No. 581,440
Claims priority, application Japan, Sept. 8, 1972, 47-90154
Int. Cl.² E21C 37/04
U.S. Cl. 299—10 3 Claims



1. A method of breaking a two sided concrete structure having reinforcing members designed to withstand stress from a first side and characterized by having adjacent to the second side of said two sided structure an independent concrete structure comprising

placing a hydraulic jack between said two adjacent concrete structures with one end of said jack having a loading member placed in contact with said second side of said two sided concrete structure and placing the other end of said jack having a reaction force supporting means in engagement with said independent concrete structure, and

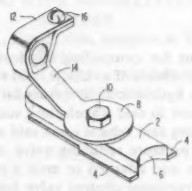
applying hydraulic pressure to said hydraulic jack to apply a bending stress to said two sided concrete structure whereby said two sided concrete structure is broken.

3,931,998

BLOWOUT PREVENTING DEVICE FOR VEHICLE WHEELS

William H. Carson, Helenwood, Tenn. 37755

Filed Oct. 23, 1974, Ser. No. 517,349
Int. Cl.² B60B 1/06
U.S. Cl. 301—63 R 4 Claims



1. A vehicle wheel assembly comprising,

a wheel having a rim provided with an axially elongated slot,

an inner tube provided with an axially elongated inflation stem which is movable through the slot during placement of the inner tube on the wheel,

a rigid filler piece positioned in the slot, said filler piece having an outer retainer portion and a central portion lying within the slot,

said central portion having an abutment surface at one end thereof for confronting the stem of the inner tube in the plane of the rim,

said abutment surface being open-ended with no obstructions lying axially thereof whereby the filler piece may be moved into position against a stationary inflation stem,

said outer retainer portion being integral with the central portion and extending beyond the slot in a circumferential direction to lie against the wheel and prevent displacement of the filler piece from the rim in a radially inward direction, and

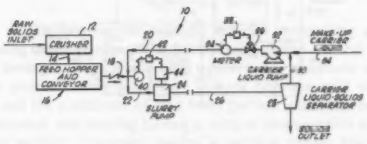
inner retainer means for clamping the central portion to the inner face of the rim to prevent separation of the filler piece from the wheel upon deflation of the inner tube.

3,931,999

APPARATUS FOR HYDRAULICALLY TRANSPORTING SOLIDS

David L. McCain, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Nov. 4, 1974, Ser. No. 520,390
Int. Cl.² B65G 53/30, 53/66
U.S. Cl. 302—14 3 Claims



1. Apparatus for forming and transporting a particulated solids-carrier liquid slurry between first and second locations in a closed carrier liquid-slurry circuit comprising:

a hopper for receiving said particulated solids at said first location having an inlet and and outlet;

at least one screw conveyor attached to the outlet of said hopper for receiving particulated solids therefrom, said screw conveyor including a solids discharge connection;

check valve means sealingly attached to said solids discharge connection of said screw conveyor for allowing the passage of particulated solids from said conveyor therethrough, but preventing the backflow of particulated solids and carrier liquid into said conveyor;

a closed solids carrier-liquid slurry mixing chamber having a solids inlet connection sealingly connected to said check valve means, a carrier liquid inlet connection and a solids-carrier liquid slurry outlet connection;

first conduit means connected to said carrier liquid inlet connection of said mixing chamber for conducting a continuous stream of carrier liquid thereinto;

a solids-carrier liquid slurry pump having suction and discharge connections;

second conduit means connected between the solids-carrier liquid slurry outlet connection of said mixing chamber and the suction connection of said pump;

third conduit means for conducting said solids-carrier liquid slurry to said second location connected to the discharge connection of said pump; and

means attached to said pump for controlling the flow rate at which said solids-carrier liquid slurry is pumped through said third conduit means in direct proportion to changes in the pressure of said stream of carrier liquid upstream of said pump so that said pressure is controlled at a predetermined level.

3,932,000

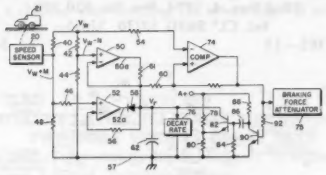
ADAPTIVE BRAKING SYSTEM REFERENCE PULL DOWN

James M. Needham, South Bend, Ind., and Robert E. Weber, Newport News, Va., assignors to The Bendix Corporation, Southfield, Mich.

Filed Sept. 11, 1974, Ser. No. 504,944
Int. Cl.² B60T 8/10
U.S. Cl. 303—21 BE 20 Claims

1. In a wheeled vehicle having first means in contact with a road bed and braked by a braking force, an adaptive system comprising means for attenuating said braking force when energized into a first state and for restoring braking force

when energized into a second state and control means for energizing said means for attenuating into at least said first and second states, said control means including means responsive to motion of said first means for generating performance signals correlated to the dynamic preformance of said first means, said control means energizing said means for attenuating into said first state when said performance signals satisfy first predetermined performance criteria having a normal level, satisfaction of the first performance criteria by said performance signals being indicative of wheel skid imminence and subsequently energizing said means for attenuating into said second state when said performance signals satisfy second



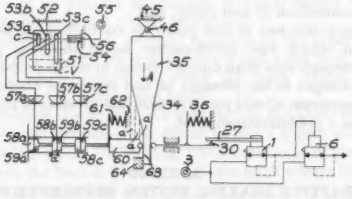
predetermined performance criteria, and, means for altering said first predetermined criteria in a direction away from satisfaction of said performance criteria by said preformance signals to a level indicative of more imminent wheel skid than normal and in response to the energizing of said means for attenuating into said second state and including means responsive to the alteration of said first predetermined criteria for subsequently and relatively slowly restoring said first predetermined criteria to the normal level whereby during the time that said first predetermined criteria is being restored the performance signals must be indicative of more imminent wheel skid than normal in order to satisfy the altered criteria.

3,932,001

PNEUMATIC CONTROL DEVICE WITH PROGRAMMED CHARACTERISTIC PARTICULARLY FOR A VEHICLE BRAKING DEVICE

Siméon Lekarski, St.-Cloud; Pierre Hardy, and Leon Hardy, both of Paris, all of France, assignors to Siméon Lekarski, Saint-Cloud; Pierre Hardy and Leon Hardy, both of Paris, all of, France

Division of Ser. No. 103,682, Jan. 4, 1971, Pat. No. 3,796,135. This application Aug. 29, 1973, Ser. No. 392,446
Claims priority, application France, Jan. 8, 1970, 70.00644
Int. Cl.² B60T *8/18*
U.S. Cl. 303—22 R **3 Claims**



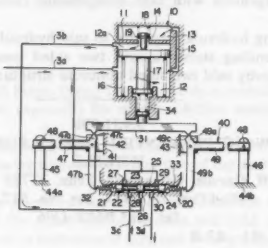
1. A pneumatic control device with programmed characteristics, particularly for a vehicle braking device, the vehicle having a bodywork, a brake pedal, and at least one axle, a pilot reducing valve connected respectively to a source of compressed fluid supply, to the atmosphere and to a fluid outlet conduit terminating in a pneumatic control member for the brakes on the respective axles, said reducing valve having members controlling the passage of fluid in dependence on the relative positions thereof, a programming means associated with at least one of said members and moving that member, said programming means comprising a plate having oppositely contoured faces, one of said faces being in slidable contact with said at least one of said members of said reducing valve, the other of said contoured faces being in slidable contact with a piston means, said piston means being urged against said plate by fluid pressure applied to a plurality of connected cylinders associated with said piston means, means for applying a varying fluid pressure to respective cylinders in dependence on the position of the bodywork relative to the axle, said means being effective to apply more pressure when the vehicle is loaded then when the vehicle is not loaded, said plate being operatively connected to the brake pedal and being progressively movable between said piston means and said at least one of said members.

3,932,002

BRAKE CONTROL APPARATUS

Norio Komoda, and Zensaku Murakami, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Sept. 27, 1974, Ser. No. 510,030
Claims priority, application Japan, Sept. 28, 1973, 48-108555
Int. Cl.² B60T *8/24*
U.S. Cl. 303—22 R **9 Claims**

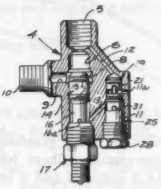


1. Apparatus for controlling application of braking fluid pressure to the wheels of a vehicle, said vehicle having left and right wheels, a hydraulic fluid system for individually applying braking pressure to said wheels, and suspension springs resiliently supporting said vehicle upon said wheels, said apparatus comprising a pressure reducing valve connected in said hydraulic system and adapted to emit a reduced level of fluid pressure, a directional control valve for selectively directing application of said reduced fluid pressure to either said right or said left wheels of said vehicle, load sensitive means including lever means responsive to movement of portions of said vehicle body located below said suspension springs, said load sensitive means being repsonvie to changes in load produced when said vehicle is turned simultaneously with application of braking force to said wheels to cause pivoting of said lever means, a connecting member operatively interposed between said lever means and said pressure reducing valve for adjusting the degree of pressure reduction effected by said valve in response to movement of said lever means, and actuator arm means mounted for pivotal motion together with said lever means and engaging said directional control valve to control the application of pressure therethrough to said wheels during turning of said vehicle to transmit said reduced fluid pressure from said pressure reducing valve to said vehicle wheels located inwardly of the turning curve of said vehicle.

3,932,003
RELEASE DEVICE FOR EMERGENCY BRAKE ACTUATORS

Donald T. McGregor, 8067 Monroe Ave., Stanton, Calif. 90680

Filed Nov. 22, 1974, Ser. No. 526,239
Int. Cl.² B60T 15/02
U.S. Cl. 303—68 8 Claims



5. A release device for an emergency brake actuators which is held in its brake releasing position by air pressure supplied through an air supply line and is urged to a brake setting position by a spring upon loss of air pressure in the air supply line, the release device utilizing an auxiliary source of air pressure, said release device comprising:

a. valve means interposed in the air supply line including a primary and secondary inlet and an outlet, the valve means including a valve element having a first position responsive to pressure in the air supply line connecting the primary inlet and outlet to provide primary communication between the air supply line and the actuator for moving the actuator to its brake releasing position, and a second position closing the primary inlet and providing a secondary communication between said auxiliary source of air pressure and the outlet said valve element being responsive to pressure at said secondary inlet for maintaining the actuator in its brake releasing position in the absence of adequate pressure in the air supply line;

b. and a shut-off valve normally closing the secondary inlet on removal of the auxiliary source of air pressure thereby to maintain brake releasing air pressure in the actuator.

3,932,004
RUBBER BEARING WITH NON-METALLIC SUPPORT MEMBER

Roy L. Orndorff, Jr., Kent, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

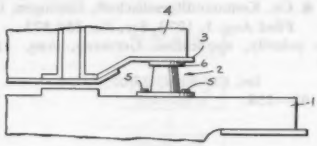
Filed Feb. 6, 1975, Ser. No. 547,586
Int. Cl.² F16C 33/20
U.S. Cl. 308—238 7 Claims

1. In a generally cylindrical water-lubricated bearing comprising a plurality of bearing portions of resilient elastomeric material separated by longitudinally extending lubricant passages, each bearing portion secured to a rigid non-metallic supporting member, the improvement wherein said non-metallic supporting member is a composite structure consisting essentially of a non-corrosive, non-shrinkable, non-conductive fibrous component embedded in and distributed substantially evenly throughout a vulcanized synthetic rubber component.

3,932,005
ELASTOMERIC RAILWAY CAR WITH SIDE BEARING

Henry F. Miller, Clifton, N.J., assignor to Uniroyal Inc., New York, N.Y.

Filed May 10, 1974, Ser. No. 468,848
Int. Cl.² B61F 5/14, 5/24; F16C 17/04, 27/02
U.S. Cl. 308—138 12 Claims

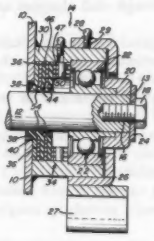


1. A side bearing for railroad vehicles comprising an upstanding body portion of approximately frusto-conical shape and having a vertical axis, the upper bearing surface of said body portion being outwardly convex between said vertical axis and the perimeter of said body portion when the bearing is unloaded, the bearing having a vertical cross section with an upper surface convexity having a vertical center line positioned on each side of said vertical axis and between said vertical axis of the bearing and said perimeter of said body portion when the bearing is unloaded, a flanged base portion integrally formed on the lower end of said body portion, said body portion and said base portion being formed of an elastomeric material.

3,932,006
PADDLE SHAFT SEAL ASSEMBLY

Christian T. Tertinek, 3301 Cheshire Road, Canandaigua, and Alan J. Stone, P.O. Box 354, Honeoye, both of N.Y. 14471

Filed May 22, 1974, Ser. No. 472,466
Int. Cl.² F16C 33/78
U.S. Cl. 308—187 5 Claims



1. A triple seal and bearing assembly for receiving and supporting one end portion of a driven rotary shaft, said assembly including a housing adapted to be secured to an end wall of a receptacle through which the driven shaft passes, a bearing unit surrounding said shaft and supporting the shaft from the housing, adjacent the extremity of the shaft, a trunnion member surrounding and journaling said housing from a support, means lubricating the interior of the trunnion member, said assembly including a plurality of alternating, annular, seals and spacer means partially filling the space between said end wall and said bearing unit, a further lubrication means in communication with the space containing said seals and spacer means, the first seal immediately adjacent said end wall being a urethane seal followed by a single spacer, a first of two synthetic rubber seals, a second single spacer, a second synthetic rubber seal, a third single spacer, and a double spacer filling the space between said second seal and said bearing unit, the inner edges of the annular seals being bent toward said end wall, during assembly, so that any foreign material which may have entered during rotation of said shaft will be

forced back toward the end wall when pressurized lubricant is forced into the space receiving the seals and spacer means.

3,932,007

SLIDING-JOINT ASSEMBLY FOR TEST FRAME OR THE LIKE

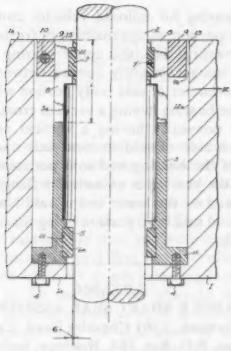
Burkhard Schnell, Ulm, Danube, Germany, assignor to Zwick & Co. Kommanditgesellschaft, Einsingen, Germany

Filed Aug. 1, 1973, Ser. No. 384,573

Claims priority, application Germany, Aug. 11, 1972, 2239555

Int. Cl.² F16C *27/00, 33/00*

U.S. Cl. 308—238 **7 Claims**



1. A guide assembly comprising:

a machine element adapted to be displaced;

a rod extending through said element and slidably guiding same;

a tubular and elongated bushing spacedly surrounding said rod and formed adjacent one end with at least one longitudinally extending open slot;

means for securing the other end of said bushing to said element;

a first guide ring carried in said bushing at said other end and having an inner periphery spaced from said rod by a predetermined distance;

a second guide ring carried in said bushing at said one end and having an inner periphery snugly surrounding said rod; and

means for urging said one end inwardly toward said rod thereby pressing said second ring against said rod.

3,932,008

BEARING HAVING A SELF-LUBRICATING LINER AND METHOD OF MAKING

Albert R. McCloskey, Fairfield, and Gordon T. Williams, Newtown, both of Conn., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 441,479, Feb. 11, 1974. This application Dec. 11, 1974, Ser. No. 531,524

Int. Cl.² F16C *17/00*

U.S. Cl. 308—238 **4 Claims**

1. A spherical bearing having a low-friction bearing surface comprising:

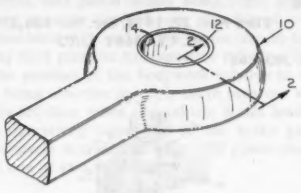
a support structure;

a liner secured to said support structure;

said liner including a layer to provide said bearing surface remote from said support structure, a backing material to which said layer is attached, and an adhesive means between said backing material and said support structure;

said layer containing a resin matrix including therein a random dispersion of self-lubricating particles;

a first of said particles being fluorocarbon; and



a second of said particles being graphite fibers which are high modulus, non-circular fibers having a maximum width of about 14.0 microns and a length substantially greater than said maximum width to cause said fibers to lie in a general stacked configuration within said layer.

3,932,009

TABLE

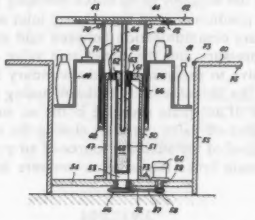
Hansrudolf Zollinger, Zuercherstr. 72, Oberengstringen, Switzerland

Continuation-in-part of Ser. No. 322,616, Jan. 11, 1973, abandoned. This application Mar. 1, 1974, Ser. No. 447,374

Claims priority, application Switzerland, Jan. 11, 1972, 356/72; Oct. 18, 1973, 14737/73

Int. Cl.² A47B *9/04, 9/20, 51/00, 77/18*

U.S. Cl. 312—312 **3 Claims**



1. A table particularly of the type known as a club table, comprising the combination of

first and second top surface portions;

means for supporting said first surface portion including upstanding support walls and a horizontal member extending between said walls;

means for supporting and moving said second surface portion between a normal position in which said first and second portions are flush and a second position in which said second surface portion is elevated above said first surface portion;

shelf means supported beneath said second surface portion, said means for supporting and moving being effective to elevate said second surface portion to a position in which said shelf means has a major surface flush with said first surface portion;

said means for supporting and moving said second surface comprising

first and second telescoping guide tubes, said first tube depending from said second portion and surrounding said second tube, said shelf means being supported on said first tube;

means for preventing relative rotation between said guide tubes; and

vertically extendible telescoping guide and drive means, substantially surrounded by said second tube, and having one end connected to said second surface and the other

end connected to said means for supporting said first surface portion for elevating said second surface portion,

said telescoping guide and drive means further comprising

a tube mounted for rotation in said horizontal member, said tube comprising a lubricant reservoir substantially filled with lubricant;

a spindle nut mounted on said tube for rotation therewith, said nut having an internally threaded central opening;

an externally threaded spindle depending from said second surface portion and engaging said opening in said spindle nut; and

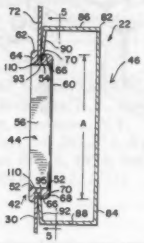
means for rotating said tube.

3,932,010

FLUSH PULL ARRANGEMENT FOR OFFICE FURNITURE

Max H. Kenworthy, Montgomery, Ill., assignor to All-Steel, Inc., Aurora, Ill.

Filed Jan. 23, 1975, Ser. No. 543,359
Int. Cl.² A47B *88/00*
U.S. Cl. 312—320 **8 Claims**



1. A pull arrangement comprising:

a plate member having a planar portion defining a front surface on one side of same and a rear surface on the other side of same,

an aperture formed in said planar portion,

an open centered planar trim piece seated in said aperture and having a front portion on the front side of said plate member and a rear portion on said trim piece defining a flange portion along each of two diametrically opposed segments of said trim piece projecting in the plane of said trim piece and outwardly of same that are in abutting relation with said plate member front surface and are at the front side of said trim piece,

said trim piece further defining along each of said segments thereof a ridge projecting outwardly of said trim piece and in the plane thereof, with said ridges being on the rear side of said trim piece,

said ridges and flange portions of the respective trim piece segments being separated therealong to define a slot along the respective trim piece segments,

said ridges being proportioned in the plane of said trim piece for making the rear portion of said trim piece movable through said aperture from the front side of said plate member when one of the opposed marginal portions of said plate member defining said aperture is lodged in one of said slots with the rear side of the trim piece facing rearwardly of said plate member,

means for centering said trim piece within said aperture,

and a cover member on the other side of said plate member and defining opposed edge portions respectively frictionally received in said trim piece grooves,

said cover member edge portions each defining a tab at either end of same and disposed to one side of said trim piece,

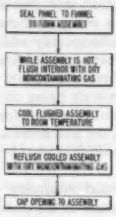
with said tabs of each cover member edge portion being compressed against said plate member rear surface in straddling relation to said trim piece for holding said trim piece and cover to said plate member against rattle.

3,932,011

CONDITIONING PARTIALLY-COMPLETED CRT BULB ASSEMBLY FOR STORAGE AND/OR TRANSIT

Joseph John Piascinski, Leola, Pa., assignor to RCA Corporation, New York, N.Y.

Filed June 5, 1974, Ser. No. 476,441
Int. Cl.² H01J *9/00, 9/38*
U.S. Cl. 316—17 **7 Claims**


SEAL PANEL TO FUNNEL
WHILE ASSEMBLY IS HOT, FLUSH INTERIOR WITH DRY NONCONTAMINATING GAS
COOL FLUSHED ASSEMBLY TO ROOM TEMPERATURE
REFLUSH COOLED ASSEMBLY
CAP OPENING TO ASSEMBLY

1. In the method of making a cathode-ray tube including the steps of

i. producing a luminescent viewing-screen structure comprising an aluminum metal layer in contact with a layer of carbon particles, said structure being supported on the inner surface of a faceplate panel,

ii. heat sealing said panel to the large opening of a funnel,

iii. and then heat sealing a mount assembly to the small opening of said funnel, the steps just subsequent to step (ii) and prior to step (iii) comprising:

a. while said panel and funnel assembly is still hot from heat sealing, flushing the interior of said assembly with a dry, noncontaminating gas,

b. cooling said flushed assembly to room temperature,

c. reflushing said cooled assembly with a dry noncontaminating gas,

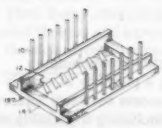
d. and then capping the small opening of said funnel with a temporary closure.

3,932,012

COMPONENT TERMINAL SYSTEM

William A. Reimer, Wheaton, and Elmer L. Scheuerman, Des Plaines, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sept. 27, 1974, Ser. No. 509,878
Int. Cl.² H05K *1/00;* H01R *11/20*
U.S. Cl. 339—17 CF **6 Claims**



1. Apparatus for terminating integrated circuits and discrete components, said apparatus comprising:

an electrically insulative frame;

a plurality of electrically conductive terminals, said terminals passing through said insulative frame and extending from a first face thereof to form circuit terminals and from the adjacent inside face thereof to form component terminals, said component terminals comprised of a rectangular shaped conductive strip, said strip containing a

V-shaped trough passing through its length to provide component terminal lead alignment, said circuit terminals comprise a metal bar to which wrapped-wire and other types of circuit connections may be made, said component terminal comprise an extension of said circuit terminal, wherein said extension is flattened to form a flat strap and forms a short section perpendicular to said circuit terminal, whereafter said strap extends beyond the inside edge of said frame in a downward and inward direction toward the center of said frame, said terminals being adapted to receive integrated components and discrete components interchangeably and at the same time, said circuit terminals form parallel first and second rows projecting from said first face of said frame, said second row of said circuit terminals being directly opposite said first row, said component terminals forming a first and second row projecting inward and downward from the respective adjacent faces of said first and second rows of said circuit terminals, and

a mounting panel, said mounting panel comprising dual slots for the projection of the component terminals below said frame and said mounting panel, said mounting panel constructed of insulative material and including at least one locating notch positioned on the edge of said slots to provide proper alignment of said frame on said mounting panel.

3,932,013

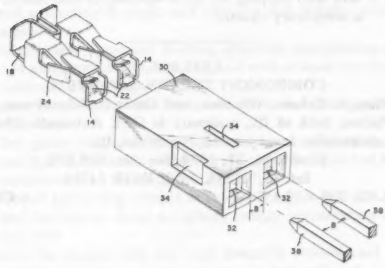
SHUNT ASSEMBLY

Marvin Leo Yeager, and Homer Ernst Henschen, both of Carlisle, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 8, 1974, Ser. No. 458,915

Int. Cl.² H01R *9/12, 31/08*

U.S. Cl. 339—19 **2 Claims**



1. A shunt assembly comprising:

a housing having a plurality of closely spaced passageways therein and a recess between adjacent passageways;

a contact array including a plurality of electrical contacts and an integral common bus bar interconnecting adjacent contacts, said contact array being stamped and formed from a single continuous strip of conductive material with said contacts extending normal to the plane of said bus bar, said bus bar having at least one fold formed therein, said at least one bus bar fold comprising at least one fold extending normal to the plane of said bus bar and parallel to the axes of said contacts so as to lie between adjacent pairs of contacts and within the overall length thereof, and extending into said recess, whereby said contacts assume a closely spaced parallel arrangement and are received in said passageways with said folded bus bar lying in said recesses.

3,932,014

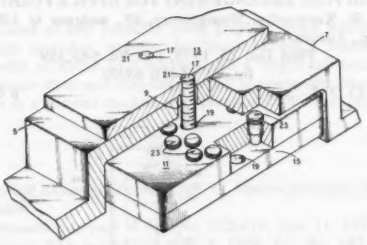
HIGH CURRENT CAPACITY ELECTRICAL CONNECTOR

Edward S. Bettis, Oak Ridge, and Harry L. Watts, Lake City, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 20, 1975, Ser. No. 560,428

Int. Cl.² H01R *7/08*

U.S. Cl. 339—22 B **3 Claims**



1. A high current capacity electrical connector for connecting a plurality of terminals, comprising:

a pair of backing plates;

a current-conducting plate disposed on one side of one of said backing plates, said backing plates disposed to receive said plurality of terminals in a sandwiched arrangement therebetween with a major surface of each of said plurality of terminals adjacent said conductor plate;

a plurality of smooth-surfaced contact buttons resiliently mounted in said conductive plate in a spaced array to provide electrical contact with said major surface of each of said plurality of terminals above said adjacent surface of said conductor plate; and

means for applying a clamping force to said backing plates so that the contacting surface of said buttons is forced against said terminals to provide electrical connection therebetween through said connector plate.

3,932,015

SUPPORT MEANS FOR AN ELECTRICALLY OPERATED TOOL

Peter George Ware, Rugby, and George Kenneth Mercer, Bedworth, both of England, assignors to Dunlop Limited, London, England

Filed Sept. 23, 1974, Ser. No. 508,618

Claims priority, application United Kingdom, Sept. 27, 1973, 45261/73

Int. Cl.² H01R *11/02;* **B26B** *19/02*

U.S. Cl. 339—58 **8 Claims**

1. Support means for an electrically operated tool having terminal means, which support means includes a tool engaging body, means on said body whereby it may be detachably assembled with the tool in any chosen one of a plurality of different attitudes relative to the tool, and terminal means on said body arranged to form an electrical circuit for energizing the tool with said terminal means on the tool in each of said attitudes of the body, wherein the terminal means on said body includes terminal elements which extend through the

body and are exposed therefrom at their opposite ends at opposite faces of the body, each of said terminal elements

being adapted for electrical connection to a respective wire intermediate the exposed ends of the terminal elements.

3,932,016

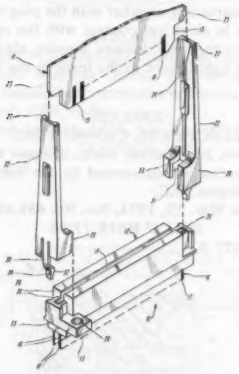
PRINTED CIRCUIT CARD RECEPTACLE

Herbert H. Ammenheuser, Henrietta, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 347,273, April 2, 1973, abandoned. This application Feb. 4, 1974, Ser. No. 439,493

Int. Cl.² H01R *13/62, 13/54*

U.S. Cl. 339—65 **3 Claims**



1. A receptacle for receiving a planar pluggable element and electrically connecting said element with other elements, said receptacle comprising:

a mountable connector for receiving said pluggable element;

a channel member formed at either end of said connector;

a pair of guides each having a sleeve portion at one end thereof and an arm portion, said sleeve portion slideably engageable along a common axis with said channel member to affix said guides to said connector;

a locking means for preventing slideable disengagement of said channel member and said sleeve portion along their common axis, said locking means including a resilient member, deflected by said slideable engagement to an open position, having a detent for locking against a surface of the connector normal to said common axis in a closed position and a finger tab for releasing the locking engagement;

said guides when affixed to said connector having said arm portions mutually opposed for receiving said pluggable element therebetween and guiding said pluggable element to said connector, and spaced apart at ends thereof opposite said one end a distance less than the width of said pluggable element received, said guides formed of a material allowing resilient flexure of said arm portions to grip said pluggable element; and

a second locking means for holding said pluggable element in said receptacle formed integrally with said guides including a spring member flexed by said pluggable element received between said arm portions, and a catch engageable with said pluggable element received in said connector.

3,932,017

ELECTRICAL TERMINAL ASSEMBLY AND TERMINAL THEREFOR

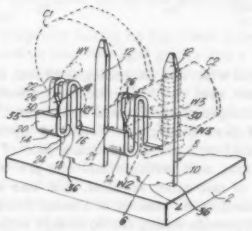
Helen Dechelette, Saint Cloud, France, assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 15, 1974, Ser. No. 469,998

Claims priority, application France, May 30, 1973, 73.19918

Int. Cl.² H01R *13/32*

U.S. Cl. 339—97 P **1 Claim**



1. An electrical terminal comprising a base in the form of a flat plate, a lug projecting from one edge of the plate, an external lead connecting post projecting from the opposite edge of the plate and an electrical component supporting and connecting member also projecting from the opposite edge of the plate, the connecting member comprising a pair of parallel plates connected by a bight of the terminal material, the bight having a lead wire guiding mouth communicating with a lead wire receiving slot in each of the parallel plates, the slot of one of the parallel plates being narrower than the slot of the other parallel plate, the other parallel plate being directly connected to the opposite edge of the base plate and being coplanar therewith, the post being coplanar with the other parallel plate, the one parallel plate being connected by a bight to a wire severing plate parallel thereto and having a wire severing edge extending across the slot of the one parallel plate.

3,932,018

ELECTRICAL CONNECTIONS FOR CLOSELY SPACED CONDUCTORS AND APPARATUS FOR FORMING SUCH CONNECTIONS

Stuart L. Parsons, Belleair Beach, and Henry George Wasserlein, Jr., Seminole, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 288,199, Sept. 11, 1972, abandoned. This application Nov. 21, 1974, Ser. No. 525,898

Int. Cl.² H01R *13/38*

U.S. Cl. 339—99 R **2 Claims**

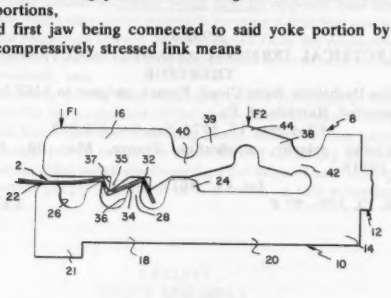
1. An electrical connection between an elongated conductor and a connecting device,

said connecting advice comprising a relatively thin sheet metal one-piece plate-like connecting member having a

yoke portion and first and second jaws, said jaws having free ends and having fixed ends, said fixed ends being spaced from and connected to, said yoke portion, said jaws and said yoke portion being co-planar,

said jaws being closed onto said conductor with said conductor extending into said jaws between said free ends and towards said yoke portion, said jaws having interdigitated contact portions comprising teeth extending from said jaws, said contact portions engaging said conductor, said contact portions comprising surface portions on said teeth on said first jaw facing generally towards said free ends and surface portions on said teeth on said second jaw facing generally towards said yoke portion, said conductor having portions extending between said contact portions,

said first jaw being connected to said yoke portion by a compressively stressed link means



a web integral with, and extending between, said first and second jaws, said web being located between said teeth and said compressively stressed link means,

one of said jaws having an elongated opening therein whereby said one jaw comprises a pair of coextensive strap sections, said teeth on said one jaw being integral with one of said strap sections, said one strap section being stressed in the manner of a beam fixed at each end thereby to provide added stored energy urging said teeth on said one strap section against said conductor and against said teeth on said other jaw whereby,

said first jaw is resiliently biased outwardly from said yoke portion by said compressively stressed link means, and said contact portions of said first jaw are thereby urged against said portions of said conductor and against said contact portions of said second jaw thereby to establish electrical contact with said conductor.

3,932,019

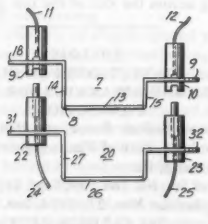
JACK TYPE ADAPTOR

John Fallotico, 39 Yahara Ave., Rutherford, N.J. 07070

Filed July 18, 1974, Ser. No. 489,784

Int. Cl.² H01R 13/50

U.S. Cl. 339—176 M **3 Claims**



1. A jack type adaptor for electrically connecting an electric light fixture to an electric box, the light fixture having electrically conductive leads for energizing said light fixture and the electric box having electrically conductive leads therein, said adaptor comprising

a jack type connecting member for mechanical connection to an electric box, said jack type connecting member comprising a first substantially U-shaped bracket device and a pair of jack type connecting devices affixed to the bracket device in spaced substantially parallel relation and electrically connected to the electrically conductive leads in the electric box, the jack type connecting member comprising a first substantially planar bracket plate, a first pair of side members extending substantially perpendicularly from the first bracket plate along part of opposite edges thereof, a first pair of head members each extending substantially perpendicularly from a corresponding one of the first pair of side members at the free edge thereof and substantially parallel to the first bracket plate, each of the head members of the first pair of head members extending away from the side member of the other head member, and a pair of jack type connecting devices each affixed to and extending substantially perpendicularly from a corresponding one of the head members of the first pair of head members, each of the jack type connecting devices extending toward the first bracket plate, each of the head members of the first pair of head members having a hole formed therethrough for accommodating the corresponding one of the jack type connecting devices affixed thereto; and

a plug type connecting member for mechanical connection to a light fixture, said plug type connecting member comprising a second substantially U-shaped device and a pair of plug type connecting devices affixed to the second device in spaced substantially parallel relation and electrically connected to the electrically conductive leads of the light fixture, the plug type connecting member being of the same general configuration as the jack type connecting member but of larger dimensions to permit the juxtaposition of the plug type connecting member on the jack type connecting member with the plug type connecting devices in electrical contact with the corresponding jack type connecting devices thereby electrically connecting the light fixture to the leads in the box.

3,932,020

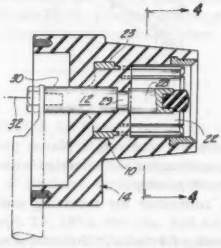
ELECTRICAL CONNECTORS

Robert L. Gilbert, Jr., Warren, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 29, 1974, Ser. No. 456,407

Int. Cl.² H01R 17/06

U.S. Cl. 339—177 R **1 Claim**



1. An electrical connector assembly comprising a first conductive element formed as a one piece metal casting; said casting including a main annular body portion having a first post-like extension off-set from but parallel to the body portion axis, the end area of the annular body portion remote from the post-like extension having a number of slits machined therein parallel to the body portion axis, said slits separating the end area of the annular body portion into an equivalent number of stiff resilient cantilever arms, said slits extending only part way along the axial dimension of the

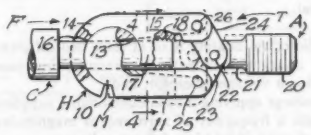
annular body portion whereby the unslit area of said body portion defines an uninterrupted ring-like annulus; said electrical connector assembly further comprising a second one piece conductive element having a pin-like body portion located on the axis of the aforementioned annular body portion and within the space circumscribed by the resilient cantilever arms; said second conductive element further including a second post-like extension off-set from but parallel to the body portion axis, and a transition portion integrally joining the pin-like body portion and the second post-like extension; said electrical connector assembly further comprising a dielectric body molded around selected portions of the first and second conductive elements to anchor them in spaced-apart relationship; said dielectric body comprising a central dielectric section surrounding and embedding therein the ring-like annulus area of the first element and the circumscribed portion of the second element; said dielectric body further comprising an annular shroud portion surrounding but spaced outwardly from the cantilever arms to permit limited deflection movements of said arms about their connections with the aforementioned ring-like annulus; the aforementioned post-like extensions projecting axially through the dielectric body to provide exposed post end faces, said post-like extensions having threaded openings in their exposed end faces for reception of lead wire-attachment screws; the aforementioned dielectric body having lead wire openings in its side surface so that the lead wires are enabled to extend into the dielectric body normal to the post-like extensions; the aforementioned conductive elements having circular contours taken around the aforementioned axis, thus permitting the defined electrical connector assembly to swivel around the aforementioned axis for accommodation of different lead wire directions; the post-like extensions being widely spaced on a diammetrical line passing through said axis.

3,932,021

TENSION ENERGIZED CABLE CLAMP

Paul V. Cornell, Amherst, Mass., and Robert E. Lawlor, Huntington Beach, Calif., assignors to Electro Clamp Corporation, Beverly Hills, Calif.

Filed Apr. 10, 1974, Ser. No. 459,578
Int. Cl.² H01R 7/08
U.S. Cl. 339—266 R **9 Claims**



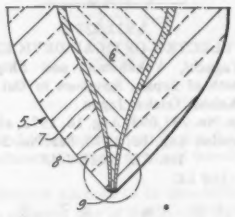
1. In a cable clamp:
a male jaw having at one end a transverse trunnion provided with a diametrical cable-receiving bore;
a female jaw having at one end a transverse socket receiving said trunnion to provide a hinge connectiong said one ends for opening and closing movements of said jaws;
said jaws having respective opposed cable-gripping surfaces spaced from said hinge toward the other end of said jaws;
said socket having at one end an opening adapted to register with said trunnion bore in an open position of said jaws so that a cable may be passed through said opening and said bore and received between said gripping surfaces;
an anchor part for attachment to an anchor body; and
tension responsive means connecting said anchor part to the other ends of said jaws for developing gripping engagement of said gripping surfaces against said cable in response to increased cable tension.

3,932,022

LIGHT GUIDE ARRANGEMENT WITH SCANNING TIP TO RESIST UNEVEN WEAR

Wolfram Henning, and Michael Gettwart, both of Allersberg, Germany, assignors to The Rank Organisation Limited, London, England

Filed Nov. 19, 1973, Ser. No. 417,283
Claims priority, application Germany, Nov. 17, 1972, 2256425
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 R **12 Claims**



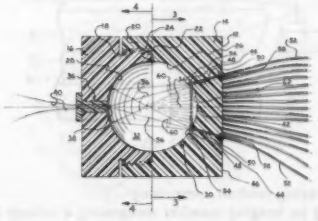
1. In a light guide arrangement of the type having:
at least two light guides having first and second ends respectively, and
an optical integrator having an input end adjacent said first ends of said at least two light guides and a tapered scanning end, and being operative to intermix light paths of light from said first ends of said at least two light guides to provide substantially the same field of view from said second end of each of said at least two light guides even when said scanning end of said optical integrator is in contact with a surface being scanned,
the improvement wherein:
said optical integrator includes a light guiding element,
and a cladding of light impermeable nonmetallic material surrounding said light guiding element and extending from said input end to said tapered scanning end of said integrator said cladding being bonded to said light guiding element without the use of a bonding material whereby to avoid differential wear between the bonding material and said components of said optical integrator at said scanning end thereof.

3,932,023

OPTICAL COUPLER FOR TRANSMITTING LIGHT LINEARLY BETWEEN A SINGLE POINT AND PLURAL POINTS

Donald D. Humer, Dover, Pa., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Nov. 18, 1974, Ser. No. 524,524
Int. Cl.² G02B 27/14
U.S. Cl. 350—96 C **14 Claims**



14. An optical coupler comprising a surface surrounding an interior volume and having a circular cross section in planes

perpendicular to an axis extending across the volume, the interior side of the surface being light reflective, a first photo element on the surface at one end of the axis, a plurality of second photo elements on the surface, each second photo element being located equidistant from the other end of the axis, the optical axis of each second photo element being aimed at said first photo element, and either said first photo element being a photoreceptor and said second photo elements being photoemitters or said first photo element being a photoemitter and said second photo elements being photoreceptors, whereby light is linearly transmitted between said first photo element and said second photo element.

3,932,024

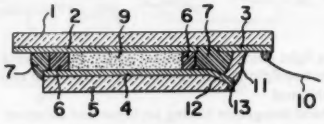
ELECTRO-OPTICAL DEVICES

Masachika Yaguchi, Yokohama, and Shigetaro Furuta, Fujisawa, both of Japan, assignors to Dai Nippon Toryo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 281,093, Aug. 16, 1972, abandoned. This application Aug. 16, 1973, Ser. No. 389,072

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC **2 Claims**



1. An optical display device comprising first and second transparent transposed plates, first and second electrodes mounted on the facing surfaces of said first and second plates, respectively, an insulating spacer interposed between said plates, a nematic liquid crystal filled between said first and second plates and within said insulating spacer, said first electrode being transparent and said second electrode being partially reflective having a light transmittance in the range of 30% to 70%, said second electrode being composed of an opaque reflective material with a plurality of fine holes formed therein, the number of holes being determined by the light transmittance desired, said optical display device being adapted to be energized by a D.C. source and wherein said first and second electrodes are a positive electrode and a negative electrode, respectively, said negative electrode comprising as an essential component titanium.

3,932,025

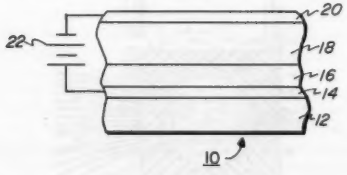
IMAGING SYSTEM

Andras I. Lakatos, Penfield, and John B. Flannery, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 25, 1974, Ser. No. 518,005

Int. Cl.² G02F 1/29; G02B 5/23; G03G 17/00

U.S. Cl. 350—160 R **37 Claims**



1. An imaging method comprising

providing an imaging member comprising a voltage or current-sensitive light modulating layer overlying a layer of photoconductive material which exhibits persistent photoconduction which overlies a layer of a metal capable of generating photoinjection currents in response to radiation which it absorbs;

applying an electrical field across said imaging member;

exposing said photoconductive layer to a first image pattern of activating electromagnetic radiation; and

exposing said photoinjection current generating metal layer to a second imagewise pattern comprising wavelengths of radiation which are absorbed by said layer whereby images corresponding to said first and second imagewise patterns are formed in said imaging member.

3,932,026

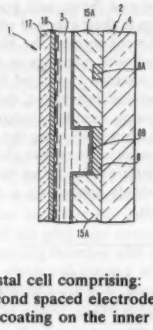
LIQUID CRYSTAL DISPLAY ASSEMBLY HAVING DIELECTRIC COATED ELECTRODES

Gerard J. Sprokel, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 303,555, Nov. 3, 1972, abandoned. This application May 27, 1975, Ser. No. 580,635

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC **18 Claims**



1. A liquid crystal cell comprising:

A. first and second spaced electrodes;

B. a dielectric coating on the inner face of said first electrode;

C. a nematic liquid crystal material between said coating and the said second electrode, with said coating separating said liquid crystal material from said first electrode; and

D. means for applying a voltage of predetermined magnitude and frequency across said first and second electrodes to cause dynamic scattering of said liquid crystal material;

wherein

E. said dielectric coating is of at least two different thicknesses characterized with a corresponding number of breakdown voltages therefor; and

F. said voltage applying means controllably supplies a voltage with a frequency of zero and at magnitudes above selected ones of said breakdown voltages.

3,932,027

BEAM SPLITTING PRISM ASSEMBLY

Gordon Henry Cook, and John Anthony Fawcett, both of Leicester, England, assignors to The Rank Organisation Limited, London, England

Filed Dec. 11, 1974, Ser. No. 531,781

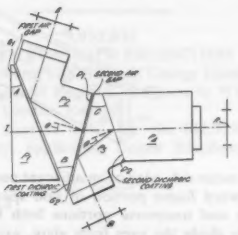
Claims priority, application United Kingdom, Dec. 11, 1973, 57285/73

Int. Cl.² G02B 27/10

U.S. Cl. 350—173 **5 Claims**

1. A beam splitting prism assembly comprising first, second, third and fourth prism elements arranged consecutively to separate incident light spatially into three different spectral components wherein the first component lies spectrally between the other two components wherein the improvement consists in said first and second prism elements considered in the direction of incident light having adjacent parallel and

spectrally substantially non-selective surfaces defining a first air gap, said second and third prism elements being separated by a second air gap, a spectrally selective dichroic coated surface and a spectrally substantially non-selective surface, parallel to said coated surface, bounding said second air gap, one of the adjacent surfaces of the third and fourth prism



elements carrying a spectrally selective second dichroic coating, wherein the surfaces defining the first and second air gaps are inclined to the direction of incident light to transmit said incident light and to totally internally reflect the light which has been selectively reflected from the corresponding dichroic surface, and wherein the apex angles of the said first, second and third prism elements lie within the following limits:

$$\frac{6\left[\sin^{-1}\left(\frac{1}{N}\right)+\sin^{-1}\left(\frac{1}{2f_oN}\right)\right]}{5} > (2B-A) \geqslant \left[\sin^{-1}\left(\frac{1}{N}\right)+\sin^{-1}\left(\frac{1}{2f_oN}\right)\right]$$

$$\frac{6\left[\sin^{-1}\left(\frac{1}{N}\right)+\sin^{-1}\left(\frac{1}{2f_oN}\right)\right]}{5} > (2C-B+A) \geqslant \left[\sin^{-1}\left(\frac{1}{N}\right)+\sin^{-1}\left(\frac{1}{2f_oN}\right)\right]$$

$$\frac{5\left[\sin^{-1}\left(\frac{1}{N}\right)-\sin^{-1}\left(\frac{1}{2f_oN}\right)\right]}{6} > A > \frac{\left[\sin^{-1}\left(\frac{1}{N}\right)+\sin^{-1}\left(\frac{1}{2f_oN}\right)\right]}{3}$$

$$\frac{4\left[\sin^{-1}\left(\frac{1}{N}\right)-\sin^{-1}\left(\frac{1}{2f_oN}\right)\right]}{3} \geqslant B > \frac{2\left[\sin^{-1}\left(\frac{1}{N}\right)+\sin^{-1}\left(\frac{1}{2f_oN}\right)\right]}{3}$$

$$\frac{5\left[\sin^{-1}\left(\frac{1}{N}\right)-\sin^{-1}\left(\frac{1}{2f_oN}\right)\right]}{4} \geqslant C > \frac{5\left[\sin^{-1}\left(\frac{1}{N}\right)+\sin^{-1}\left(\frac{1}{2f_oN}\right)\right]}{8}$$

where:

A is the apex angle of the first prism element;

B is the apex angle of the second prism element;

C is the apex angle of the third prism element;

N is the refractive index of the prism glass at the wavelength appropriate to the colour being selected, and

f_o is the widest relative aperture of camera objective with which the assembly is optically compatible.

3,932,028

MIRROR AND GUIDE DEVICE FOR A TRACTOR

Jerome J. Klingler, P.O. Box 442, New Ulm, Minn. 56073

Filed July 22, 1974, Ser. No. 490,905

Int. Cl.² G02B 5/08

U.S. Cl. 350—307 **4 Claims**

1. A mirror and guide attachment device for a tractor having a trailing cultivator implement towed thereby, said device comprising:

a mounting bracket adapted to be attachably mounted on the tractor adjacent one of the front wheels thereof,

a rigid generally rectangular mirror frame, means connecting the mirror frame with said bracket for spacing the frame laterally of the tractor body and rearwardly and adjacent one of the front tractor wheels,

a rearwardly facing generally rectangularly shaped mirror mounted on said frame, yieldable means interposed between said mirror and the frame to dampen and absorb vibrations thereto, said mirror being disposed in angulated relation and extending downwardly and rearwardly with respect to the surface of the ground, said mirror being disposed at approximately the same height as the upper portion of the adjacent front tractor wheel,

a peripheral shield structure secured to said frame and including a pair of substantially flat rearwardly projecting side plates positioned on opposite sides of the mirror and a top plate secured to said side plates and projecting rearwardly from adjacent the top portion of said mirror to reduce glare and protect the mirror from flying objects,

a substantially flat cover plate shiftably connected with said mirror frame and being swingable between open and closed positions, said cover plate when in the closed position, overlying and covering said mirror, and when in the open position, being disposed in unobstructing relation with respect to the mirror.

3,932,029

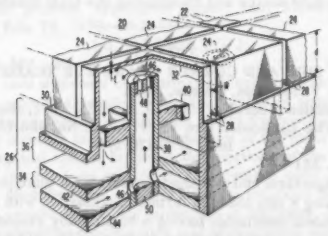
OPTICAL REFLECTOR FOR LASERS

Manfred Weiss, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 13, 1974, Ser. No. 469,327

Int. Cl.² G02B 5/08

U.S. Cl. 350—310 **4 Claims**



1. A laser beam reflector comprising:

a base,

a plurality of adjacent hollow cells, each cell having a hollow core defined by an enclosure mounted on said base, said enclosure being formed by a plurality of walls supporting a laser beam radiant energy reflecting surface spaced from said base, each of said surfaces having an edge closely spaced from an edge of an adjacent surface, said surfaces being formed into an array to provide a substantially continuous reflecting surface for radiant energy incident thereon; and

cooling means disposed in said base for providing a fluid coolant to the core of each of said hollow cells for cooling said surface,

said cooling means including coolant manifold means disposed in said base and further including coolant feed means disposed inside each core of said cell in communication with said manifold means for dispersing said fluid coolant against said walls and surface,

said edges being spaced from each other a distance arranged to dissipate negligible radiant energy from said beam between said walls.

3,932,030

ILLUMINATING DEVICE IN AN OPHTHALMOMETER

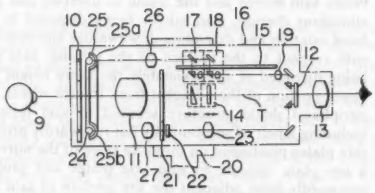
Hiroshi Hasegawa, Kawasaki, and Toru Sato, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed May 16, 1974, Ser. No. 470,561

Claims priority, application Japan, May 22, 1973, 48-59456[U]

Int. Cl.² A61B 3/00

U.S. Cl. 351—6 **2 Claims**



1. An ophthalmometer in which a chart plate is projected on the cornea of an eye to be examined, and by the image reflected thereby the curvature radius of the cornea of an eye and the angle of astigmatism axis are measured, comprising

an optical system (**11, 12, 13**) for viewing the chart image reflected by the cornea,

a light source (**24**) formed to surround the optical path of the viewing optical system for projecting the chart plate onto the cornea,

displaceable measuring means (**14, 20**) for measuring the curvature radius of the cornea and the astigmatism axis,

scale means (**15, 21**) for indicating each amount of displacement of the measuring means as the curvature radius and the angle of rotation, and

means (**25, 25a, 25b, 26, 27, 17, 18**) for dividing light from the light source and illuminating the scale means.

3,932,031

SIDE AND CORNER GLARE EYE SHADE

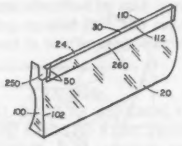
William V. Johnston, Omaha, Nebr.

Continuation of Ser. No. 136,913, April 23, 1971, abandoned. This application Oct. 9, 1973, Ser. No. 404,138

Int. Cl.² G02C 9/04

U.S. Cl. 351—47 **7 Claims**

1. A spectacle and side shade assembly for glare protection comprising a side shade in further combination with a pair of conventional spectacles having a horizontally extending bow and a lens-supporting forward frame portion, said side shade having a main side shade portion having forward and rearward ends and right and left sides and hanging substantially beneath said bow, attaching means connected to said main side shade portion and attaching in an easily removable way said main side shade portion to said bow whereby without using tools a user can manually remove said side shade from said bow and attach said side shade to said bow, a transverse shade portion extending transversely of and to one side of said main side shade portion, said transverse shade portion substantially



lapping the outer side edge of an adjacent part of said lenssupporting forward frame portion of said spectacles, said side shade main and transverse portions both being adapted to substantially shade the eyes from glare, except by means of said spectacles said side shade being free of any connection to any other side shade.

3,932,032

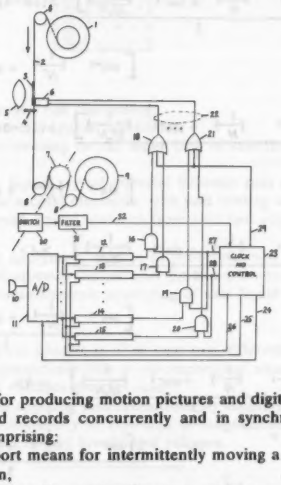
MOTION PICTURE SOUND SYNCHRONIZATION

Stephen B. Weinstein, 20 Algonquin Road, Holmdel, N.J. 07733

Filed Apr. 3, 1974, Ser. No. 457,625

Int. Cl.² G03B 31/02

U.S. Cl. 352—11 **12 Claims**



1. A system for producing motion pictures and digital photographic sound records concurrently and in synchronism, said system comprising:

a. film transport means for intermittently moving a photographic film,

b. means for recording a plurality of visual images on said photographic film,

c. means for producing a continuous analog sound waveform,

d. means for periodically sampling said waveform and producing a sequence of analog values, each proportional to the analog value of said waveform during respective samplings,

e. an analog to digital converter for converting said sequence of analog values into a sequence of digital values functionally related to said analog values,

f. means for storing and buffering said sequence of digital values,

g. means for optically imprinting digital indicia on said photographic film adjacent to said visual images, said indicia corresponding to said sequence of digital values,

h. means for gating said sequence of digital values con-

nected between said means for storing and buffering and said means for optically imprinting,

i. means for controlling said means for storing and buffering and said means for gating such that said digital indicia are optically imprinted on said film, said digital indicia imprinted corresponding to the analog sound waveform produced during recording of the adjacent visual image.

3,932,033
CINEMATOGRAPH PROJECTORS

Leroy Gordon Osborn, Mill Hill, and George Hunnam Brownlee, Harrow, both of England, assignors to Westrex Company Limited, London, England

Filed June 21, 1974, Ser. No. 481,721

Claims priority, application United Kingdom, June 25, 1973, 30015/73

Int. Cl.² G03B *1/48*

U.S. Cl. 352—228 **9 Claims**

1. Cinematographic film projection apparatus at each side of a projection aperture including a projection gate having film marginal support surfaces convexly curved toward a light source, comprising in combination:

a. a plurality of flexible bands, at least one band extending respectively over each of said marginal support surfaces and pressure biased toward said marginal support surfaces whereby film passing between said flexible band and said film marginal support surfaces is pressed onto the said support surfaces;

b. means feeding film to said aperture at a first side thereof, and taking up said film at a second side thereof; and

c. each of said flexible bands positioned anchored on said first aperture side, and tensioned on said second aperture side.

3,932,034
DEVELOPER CONCENTRATION DETECTING AND REPLENISHMENT DEVICE

Toru Takahashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

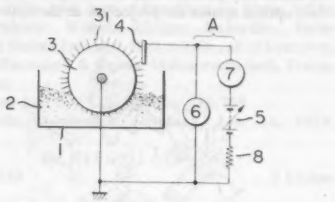
Filed June 11, 1974, Ser. No. 478,451

Claims priority, application Japan, June 20, 1973, 48-69335

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 DD **16 Claims**

1. A developer replenishment device comprising means for detecting the concentration of toner in a developer, and adjusting the toner to a proper concentration in a developer; said detector means being effective to detect the concentration of toner in said developer by detecting the dielectric breakdown voltage of the developer, and said adjusting means being operable in response to a signal from said detector means,



thereby maintaining the optimum mixture of carrier and toner of the developer.

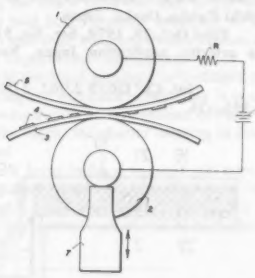
3,932,035
APPARATUS FOR TRANSFERRING A TONER IMAGE

Masamichi Sato, Tucson, Ariz., and Osamu Fukushima, Tokyo, Japan, assignors to Rank Xerox Ltd., London, England

Division of Ser. No. 333,825, Feb. 20, 1973, Pat. No. 3,854,974. This application Aug. 29, 1974, Ser. No. 502,250

Int. Cl.² G03G *15/16*

U.S. Cl. 355—3 R **9 Claims**



1. An apparatus for transferring a toner image from a toner substrate to a transfer sheet which comprises, contact means for bringing the toner substrate and the transfer sheet into face to face contact with each other, and vibrating means associated with said contact means for producing a vibration at the area of contact between said toner substrate and transfer sheet.

3,932,036
CARD PRINTER

Hiroyuki Ueda; Yukio Sawano, and Shingo Ooue, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minamiashigara, Japan

Filed Jan. 31, 1974, Ser. No. 438,517

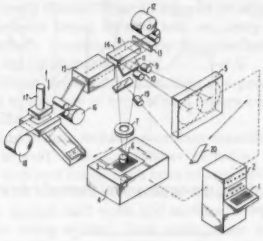
Claims priority, application Japan, Jan. 31, 1973, 48-12590; Feb. 19, 1973, 48-19911

Int. Cl.² G03B *27/52*

U.S. Cl. 355—40 **6 Claims**

1. A card dispenser comprising: a sheet-like optical information recording member bearing a number of ordered indicia recorded thereon, positioning means for moving said recording member in the coordinate axes of the plane thereof, a first optical system for projecting portions of the ordered indicia recorded on said recording member onto a photographic photosensitive paper at descrete locations thereon, a second optical system for projecting a signature, or other random identifying indicia onto said photographic photosensitive paper at a location separate from said descrete locations, means for feeding the photographic photosensitive paper through the focusing position of said first and second optical

means, means for the development processing of said photosensitive paper, means for controlling said positioning means to selectively position said recording member relative to said first optical system for projection at the optical focusing position of said first optical system, and input means for providing a signal to said controlling means for positioning the recording member in a selected pattern to define the locations for said ordered indicia and said random indicia to be recorded on said photographic photosensitive paper.



3,932,037

ORIGINAL HOLDER PLATE FOR COPYING MACHINE

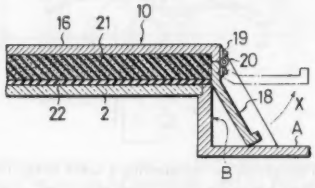
Hiroshi Ikeda, Aichi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 29, 1974, Ser. No. 516,307

Claims priority, application Japan, Nov. 17, 1974, 49-132976

Int. Cl.² G03B 27/62, 27/04

U.S. Cl. 355—76 **8 Claims**



1. In an instantaneous exposure type electrophotographic reproducing apparatus having a flash lamp below a transparent support plate for illuminating an original document located thereon, said support plate having a plurality of edges, and a light-tight, box-like cover overlying the support plate and enclosing all edges thereof, said cover having a plurality of side panels; the improvement comprising means mounting at least one said side panel of the cover for movement relative thereto, said one side panel being positionable to form a gap between said one side panel and a respective one edge of the support plate when an original document larger than the support plate is located thereon with a part of the document extending beyond said one edge of the support plate, the one side panel resting on said extending part of the document to stop light rays from the flash lamp from passing to the outside of the cover.

3,932,038

APPARATUS FOR THE CONTINUOUS MEASUREMENT OF THE DENSITY OF A LIQUID BY UTILIZATION OF THE LAW OF REFRACTION

Walter Schweizer, Berlin, and Martin-Ulrich Reissland, Gummersbach, both of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed July 2, 1974, Ser. No. 485,226

Claims priority, application Germany, July 4, 1973, 2333945

Int. Cl.² G01N 21/46

U.S. Cl. 356—133 **9 Claims**

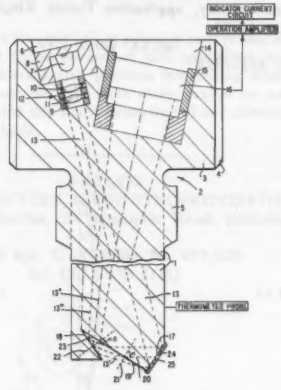
1. Apparatus for the continuous measurement of the density of a liquid within prespecified limits by utilization of the law of refraction, particularly for the continuous measurement of the acid density of a storage battery of a motor vehicle for the purpose of determining the state of charge of the battery, comprising:

an elongated light-transducing rod mounted for immersion into the liquid;

a measuring surface located at the immersion end of said rod;

a light source mounted to emit a pencil of rays which is at least nearly parallel into said rod toward said measuring surface;

said measuring surface being positioned on said rod to direct said pencil of rays at an angle taken with respect to a normal to the said measuring surface that equals at most the total reflection angle occurring at the lower density limit of said liquid;



a deflecting surface 18 arranged in the path of said pencil of rays for deflecting rays refracted into the liquid by the measuring surface;

a photosensitive element located in the path of said pencil of rays refracted by the said measuring surface into the said liquid and subsequently deflected by the deflecting surface;

a plane (22) normal to the said deflecting surface being positioned to enclose with the said pencil or rays the Brewster angle (αB) occurring at the greatest density of the liquid.

3,932,039

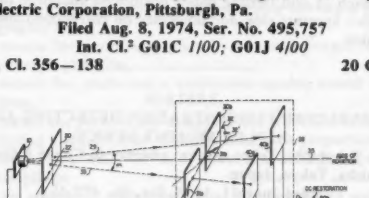
PULSED POLARIZATION DEVICE FOR MEASURING ANGLE OF ROTATION

Donald G. Frey, Ellicott City, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1974, Ser. No. 495,757

Int. Cl.² G01C 1/00; G01J 4/00

U.S. Cl. 356—138 **20 Claims**



20. In a device for measuring rotational angle wherein plane polarized light is directed to be received by rotatable polarization analyzer means operatively connected to a remote rotary body for which rotational angle relative to a reference position is measured, the improvement which comprises:

a plurality of polarization analyzers mounted side-by-side transverse to plane polarized light received by said analyzer means, each of said analyzers having a directional axis of linear polarization;

means for holding said analyzers to maintain a substantially fixed axial angle between said analyzers about an axis of rotation;

photosensor means for receiving light independently through each of said analyzers and generating time pulsed electrical signals with amplitude representative of modulated light intensity for each analyzer; and

means for determining equality between the amplitude ratio of said time pulses electrical signals and a reference value adjacent photosensor signals and generating an output signal representative of rotational angle when said equality occurs.

3,932,040
SELF-EQUALIZING INDUSTRIAL PHOTOMETER

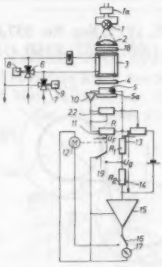
Heinz Warncke, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 20, 1973, Ser. No. 371,903

Claims priority, application Germany, June 23, 1972, 2230731

Int. Cl.² G01N *21/26*

U.S. Cl. 356—201 **11 Claims**



1. A photometer for the continuous automatic analysis of gaseous or liquid process streams, comprising an optical single-beam measuring arrangement incorporating a light source, a measuring cell through which the process stream flows, a spectral filtering means and a photoelectric receiver whose electrical signal, in the absence of luminous flux, is zero and which shows adequate linearity between luminous flux and photocurrent for the measuring wavelength and measuring light intensity selected, and further comprising

a. a working resistor having a remote-controlled voltage tap, the tapped voltage being proportional to the luminous flux, connected to said photoelectric receiver,

b. means for producing a highly constant counter voltage connected in series with the tapped voltage and a differential circuit for forming the difference between the tapped voltage and the counter voltage,

c. said measuring cell being adapted to be connected at preselected time intervals to a zero substance source so that the process stream in the measuring cell is automatically replaced for a fixed time interval by a zero substance which does not have any absorption at the measuring wavelength, and

d. a regulating device for automatically equalizing the tapped voltage and the counter voltage at the end of this time interval by varying the tapped voltage.

3,932,041
CONSTRUCTION UNIT FOR TWO BEAM PHOTOMETERS

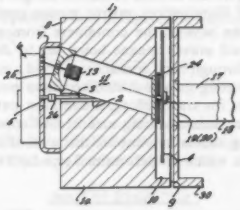
Joachim Staab; Willy Apel, both of Frankfurt am Main; Achim Dräger, Eschborn; Wilhelm-Rüdiger Haberditz, Steinbach/Ts., and Walter Fabinksi, Hattersheim, all of Germany, assignors to Hartmann & Braun Aktiengesellschaft, Frankfurt, Germany

Filed Jan. 6, 1975, Ser. No. 538,768

Claims priority, application Germany, Jan. 16, 1974, 7401319

Int. Cl.² G01J *1/10*

U.S. Cl. 356—229 **8 Claims**



1. Unit for two beam photometers using a block, there being a bore traversing the block from one end to the other; shaft means traversing said bore; a motor mounted to said block and connected to said shaft means; a shutter connected to said shaft means, the improvement comprising:

a pair of ducts in the block arranged in V-shaped configuration and having one end each terminating in two windows arranged symmetrically to termination of the bore at the one end of the block, the shutter rotating in front of said windows; and

the ducts of the V being inclined to avoid said bore, the duct ends at the bottom of the V being offset from the bore at the other block end, there being a source for radiation disposed in the bottom end of the V as formed by the ducts.

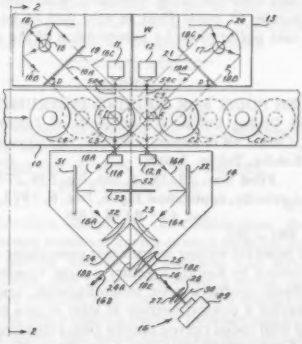
3,932,042
CONTAINER INSPECTION APPARATUS AND METHOD OF INSPECTION

Siamac Faani, and Ralph M. Chambers, Jr., both of Ferguson, Mo., assignors to Barry-Wehmiller Company, St. Louis, Mo.

Filed May 20, 1974, Ser. No. 471,453

Int. Cl.² G01N *21/24*; B07C *5/342*

U.S. Cl. 356—240 **22 Claims**



1. In container inspection apparatus, the improvement which comprises: means to move light transparent containers along a predetermined path having spaced apart container inspection stations, said moving means positioning each con-

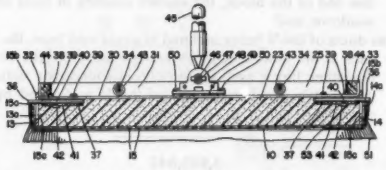
tainer in a predetermined position free of rotation during inspection, a source of illumination for each inspection station to project a light beam along a path through an inspection station, the light beam for one inspection station illuminating a side of the container thereat from an angle different from the angle of the beam of light for illuminating a different side of the container in another inspection station, such that each container is illuminated from two different sides, sensing means at each inspection station to sense the arrival of a container and activate the source of illumination for that station, said inspection stations being separated a distance such that when one sensing means activates its source of illumination the other sensing means is inactive, photo-electronic scanning means to scan container images illuminated by said sources of illumination, mirror means positioned in the light beam paths beyond the containers from said source of illumination, said mirror means being set to direct the light beam passing through each container toward a common point, light beam directing means at said common point to arrange the light beams for travel along a common path directed at said photo-electronic scanning means, and means responsive to said scanning means to compare the level of illumination in each light beam with a predetermined standard level of illumination.

3,932,043

APPLICATOR ESPECIALLY ADAPTED FOR APPLYING FLUIDS TO BOWLING LANES AND THE LIKE

Robert L. Joffre, 247 Nineteenth Ave., N.W., Barberton, Ohio 44203

Filed Feb. 12, 1975, Ser. No. 549,463
Int. Cl.² A47L *1/08, 13/22*
U.S. Cl. 401—137 **9 Claims**



1. In an applicator of the character described a pan-like member having perforations in the bottom thereof for passage of a fluid therefrom, a pad of porous, compressible material disposed in said member and adapted to hold fluid in the pores thereof, a pan-like reservoir resiliently supported by said pad and adapted to contain a quantity of said fluid, and a handle, said pan-like reservoir being responsive to downward pressure of said handle to cause fluid in said pad to be discharged through said perforations by compression of the pad.

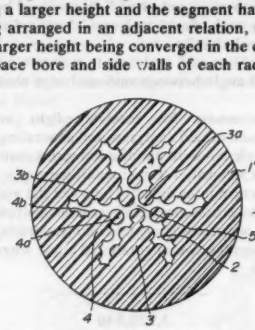
3,932,044

PEN POINT FOR WRITING INSTRUMENTS

Nobuyuki Otake; Yukinori Sato, both of Tokyo, and Kozo Ando, Chiba, all of Japan, assignors to Tokyo Boshi Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1974, Ser. No. 528,277
Claims priority, application Japan, Dec. 6, 1973, 48-136549
Int. Cl.² B43K *1/06*
U.S. Cl. 401—265 **6 Claims**

1. Pen point for writing instruments comprising a cylindrical article formed by uniting together a large number of molten thermoplastic synthetic resin monofilaments, said cylindrical article having a conical portion at least at one end, which is provided with radial curved narrow slots extending toward the center of the cylindrical article from the inside of the outer periphery of the article in the transverse section, said radial curved narrow slots being defined by an even number of at least 4 of triangular projected segments, each top portion of said triangular projected segments being circular, said triangular projected segments having two different heights, the segment having a larger height and the segment having a smaller height being arranged in an adjacent relation, said segments having the larger height being converged in the center portion to form a space bore and side walls of each radial slot being



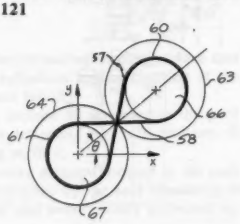
formed by a plurality of semicircles and said semicircles in opposite side walls being arranged so as to engage with each other under writing pressure, and further said radial curved narrow slots and the center space bore being axially extended from one end of the cylindrical article to the other end.

3,932,045

ROLLING CONTACT JOINT

Benny M. Hillberry, and Allen S. Hall, Jr., both of West Lafayette, Ind., assignors to Purdue Research Foundation, Lafayette, Ind.

Filed Mar. 5, 1973, Ser. No. 337,868
Int. Cl.² F16C *11/00, 32/02;* F16D *1/12, 3/00*
U.S. Cl. 403—121 **22 Claims**



1. A rolling contact joint, comprising: a first body member having a curved external surface portion; a second body member movable relative to said first body member and having an external surface portion frictionally engaging said external surface portion of said first body member to establish a non-slipping relationship therebetween during normal operation; and flexible strap means fixed to said first and second body members to maintain said external surface portions of said body members in engagement with one another and constrained to rolling contact therebetween during said normal operation.

3,932,046

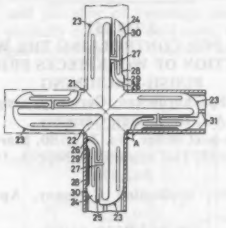
PIPE-CONNECTING DEVICE AND PIPES

Takashi Kawazu, No. 10-4, 5-chome, Nakano-cho, Miyakojima, Osaka, Osaka, Japan

Filed Oct. 29, 1974, Ser. No. 518,462
Int. Cl.² F16B *7/00*
U.S. Cl. 403—172 **3 Claims**

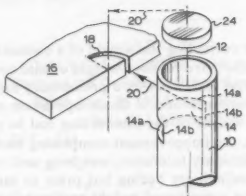
1. A pipe-connecting device with an elongated insert for connecting pipes by inserting the insert so the longitudinal edges thereof enter corresponding grooves (31) in the pipes, comprising in combination: an elongated flat inserting member (23) having a straight edge with an inner base (22) and a rounded far end; a flat pressing portion (24) separated therefrom but linked thereto by a bridge (27), said bridge forming a straight elongated notch (25) towards said rounded far end

and an outwardly curved notch (26); a longitudinal recessed groove (28) towards the rounded far end, towards the inner base, and in the intermediate portion of said pressing portion (24) forming an outer projection (30) and an inner projection (29) of slightly arcuate shape towards the outer tip thereof disposed next to said base (22), said member (23) being widest at the portion having said tip; and a reinforcing rib extending from said base along said inserting member,



whereby, said inserting member (23) can be forcefully inserted into a pipe of slightly smaller diameter, by sliding the straight edge on one side and the inner and outer projections (29, 30) on the other side into the corresponding grooves (31) in the pipe, said bridge (27) and notches (25, 26) providing resiliency to the inserting member (23) firmly engaging said pipe, said inner and outer projections (29, 30) preventing the engaged pipe from sliding off said member (23).

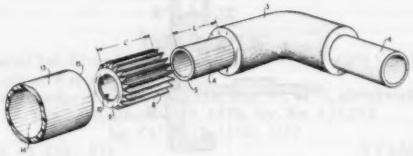
3,932,047
CONNECTING SYSTEMS
James Crossan, 512 Indian Road, Burlington, Ontario, Canada
Filed Mar. 3, 1975, Ser. No. 554,799
Int. Cl.² F16B *9/02*
U.S. Cl. 403—186 **16 Claims**



1. A connecting system for connecting together a first hollow tubular member having a longitudinal axis and a second member, wherein the first member has in the circumferential wall thereof a circumferentially-extending slot of a longitudinal extent to receive the second member therein, and the second member has therein an arcuate slot of a width to receive the first member side wall therein upon reception of the second member in the first member slot, the first member side wall being engagable in the second member arcuate slot by rotation of the first member about the said longitudinal axis.

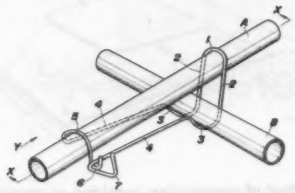
3,932,048
FURNITURE JOINTING ARRANGEMENT
Paul R. DuPont, Gillette, N.J., assignor to Thermoplastic Processes, Inc., Stirling, N.J.
Filed Jan. 17, 1975, Ser. No. 541,885
Int. Cl.² F16B *12/40*
U.S. Cl. 403—225 **6 Claims**

1. A furniture joint comprising a connector having at least one spud arm, a splined collar of elastomeric material adapted to fit snuggly over said spud arm, said splined collar having a flange at one end thereof partially enclosing said one end and a plurality of bumper elements extending inwardly and axially from said flange, said bumper elements being located so as to contact an end surface of said spud arm, and a hollow-ended member having an internal diameter dimensioned to fit over



and helically squeegee and elongate the splines of said collar during assembly.

3,932,049
PIPE CLASPER
Motohide Hirato, 2-13-18 Hase, Kamakura, Kanagawa, Japan
Filed Oct. 18, 1974, Ser. No. 515,884
Claims priority, application Japan, May 21, 1974, 49-57011[U]
Int. Cl.² F16B *7/04*
U.S. Cl. 403—397 **1 Claim**

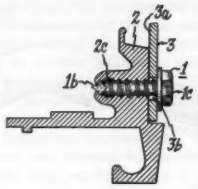


1. A pipe clasper made of an elastic steel wire comprising a first retaining portion bent in a semi-circular shape with two defined lower ends at substantially the central part of the wire for holding a first pipe, a pair of straight portions extending slantwise in parallel to each other from both said lower ends of said first retaining portion, a second retaining portion bent in a semi-circular shape at the lower ends of said pair of straight portions for holding a second pipe, and a pair of straight portions horizontally extending from the both ends of said second retaining portion, the end of one of said pair of horizontal straight portions being bent in a semi-circular shape to provide an engaging portion for said first pipe and a U-shaped reception portion at the end thereof and the end of the other horizontal straight portion having its end horizontally turned in a triangular shape to provide a hook portion adapted to engage with said U-shaped reception portions.

3,932,050
JOINT STRUCTURE
Theodor G. Yahraus, Hendersonville, N.C., assignor to General Electric Company, N.Y.
Filed Feb. 3, 1975, Ser. No. 546,806
Int. Cl.² F16B *5/02*
U.S. Cl. 403—11 **8 Claims**

1. Joint structure comprising, in combination, first and second juxtaposed members having mating adjacent surfaces, and a screw passing through and fastening said juxtaposed members together, said screw comprising a shank having a head at one end adjacent said first member, a drilling portion at the other end, and a tapping portion between said head and said drilling portion, said screw extending through a hole in said second member formed by said drilling portion of said screw, said mating surface of said second member adjacent said first member being formed with an elongated recess intersecting said hole, said tapping portion of said screw being in threaded engagement with said second member adjacent

said recess, whereby chips formed by action of said drilling portion of said screw collect in said elongated recess and said



mating adjacent surfaces of said juxtaposed members are in close mating engagement.

3,932,051

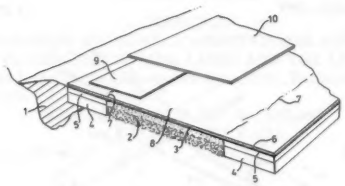
HIGHWAY CONSTRUCTION

Michael Cleary, Maidstone, England, assignor to Sumaspcae Limited, Croydon, England

Filed Sept. 3, 1974, Ser. No. 502,863

Int. Cl.² E01C *19/00*

U.S. Cl. 404—82 **12 Claims**



1. A method of constructing, repairing or strengthening a highway or other load-bearing pavement which includes the step of incorporating therein a layer comprising an alkali-resistant glass fibre-reinforced Portland cement.

3,932,052

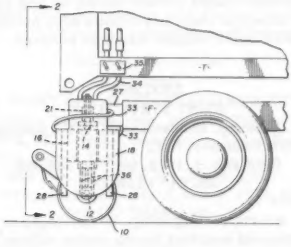
ROLLER ATTACHMENT FOR TRUCKS

Robert Fink, Youngstown, Ohio, assignor to Inglis Nurseries Inc., Youngstown, Ohio

Continuation-in-part of Ser. No. 388,480, Aug. 15, 1973, Pat. No. 3,895,880. This application Jan. 9, 1975, Ser. No. 539,931

Int. Cl.² E01C *19/26*

U.S. Cl. 404—128 **4 Claims**



1. In a hydraulically operated roller attachment for mounting on a dump truck having a main frame and a hydraulically operated dump body thereon and a hydraulic fluid power system therefor, said roller attachment comprising the combination of a transverse hollow beam detachably secured to the truck main frame at a point below the rear end of the dump body, end plates secured to the ends of the transverse hollow beam for closing the same, vertically positioned hydraulic cylinder and piston assemblies secured to said transverse beam adjacent said end plates, vertical guide members on said end plates, movable means engaging said guide members, a roller positioned between said end plates in spaced, parallel relation to said transverse beam, axles on said roller engaging said movable means, piston rods of said piston and cylinder assemblies engaging said movable means for moving said roller toward and away from said transverse hollow beam.

3,932,053

METHOD FOR CONTROLLING THE WEIGHT CORRECTION OF WORKPIECES PRIOR TO FINISH-MACHINING

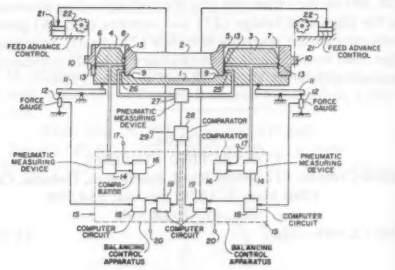
Heinrich Hack, Spachbruecken, Germany, assignor to Firma Carl Schenck AG, Darmstadt, Germany

Continuation-in-part of Ser. No. 342,780, March 19, 1973, Pat. No. 3,847,055. This application Sept. 3, 1974, Ser. No. 502,870

Claims priority, application Germany, Apr. 19, 1972, 2218904

Int. Cl.² B23D *81/00*

U.S. Cl. 408—1 **5 Claims**



1. In a method for correcting the weight of a connecting rod to produce a close tolerance finished weight of said rod which has a bore in each rod end, wherein a preliminary machining permitting wide tolerances and a finish operation are performed to vary the weight of the connecting rod to produce said finished weight, the improvement comprising boring said bores to a wide preliminary tolerance, weighing said connecting rod after said preliminary boring but prior to said finish operation to produce a measured weight representing signal, measuring the diameter of said preliminarily bored end bore to produce a measured bore diameter signal, comparing said measured bore diameter representing signal with a rated bore diameter signal to provide a diameter difference signal, producing a correction signal by combining said measured weight representing signal and said diameter difference signal, producing a control signal modified in response to said correction signal and performing said finish operation in response to said modified control signal whereby said finished weight is independent of any variations in said wide preliminary tolerance.

3,932,054

VARIABLE PITCH AXIAL FAN

Wilfred G. McKelvey, Palos Verdes, Calif., assignor to Western Engineering & Mfg. Co., Marina del Rey, Calif.

Filed July 17, 1974, Ser. No. 489,077

Int. Cl.² F01D *7/00*

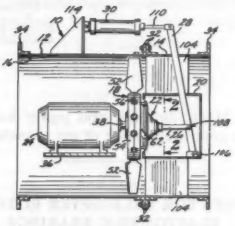
U.S. Cl. 415—130 **3 Claims**

1. A variable pitch axial fan apparatus comprising: housing means having an inner wall defining a cylindrical air conduit;

a fan centrally mounted in said air conduit for rotation about the axis of said conduit, said fan including a hub, a plurality of elongated blades radially extending from

and carried at their roots by said hub for pivotal movement about their axes, respectively, to vary the pitch of said blades, said hub including a plurality of openings adjacent the roots of said blades, respectively;

a cylindrical central fairing located in said air conduit and including an actuator coaxial with and carried by said hub for axial movement, a plurality of linkages extending between said actuator and said blades, said actuator including means defining circumferentially arranged seats adjacent said plurality of openings, and a plurality of elements pivotally carried in said seats, respectively, and said linkages including arms coupled to said blades, extending through said openings, and coupled to said elements, respectively, whereby said blades are pivoted upon said axial movement of said actuator;



fan drive means coupled to said fan for rotation thereof;

an actuator shaft extending axially of said actuator and axially movable to effect said axial movement of said actuator;

an operating lever extending generally transversely of said actuator shaft and externally of said air conduit; and

operating means located externally of said air conduit and actuable to pivot said operating lever to axially move said actuator shaft.

3,932,055

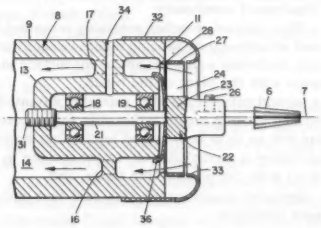
VACUUM TURBINE FOR A DRILL

Lloyd P. Flatland, 15 Quisisana Drive, Kentfield, Calif. 94904

Filed Aug. 5, 1974, Ser. No. 494,543

Int. Cl.² B23B *47/00*

U.S. Cl. 415—131 **3 Claims**



1. A vacuum turbine for a dental drill or the like comprising a housing of tubular configuration about an axis and having an end face normal to said axis, a sleeve within said housing and of tubular configuration about said axis, said sleeve being intergral with said housing and closed at one end and open at the other end and being spaced from said housing to provide an annular air passage therebetween, a pair of bearings within said sleeve and disposed adjacent the respective ends thereof, a turbine shaft mounted in said bearings and rotatable about said axis, said shaft at one end terminating within said sleeve adjacent the closed end thereof, a turbine runner on said shaft adjacent the other end of said sleeve and including blades extending radially across said air passage at the open end of said sleeve, and a circumferential shroud on said runner at the periphery of said blades and having a rim face normal to said axis in close axial spacing from said housing end face.

3,932,056

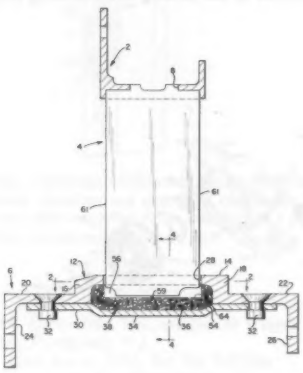
VANE DAMPING

Harold Tai, Riverside, Calif., assignor to Barry Wright Corporation, Watertown, Mass.

Continuation of Ser. No. 401,358, Sept. 27, 1973, abandoned. This application Dec. 9, 1974, Ser. No. 534,293

Int. Cl.² F01D *11/08, 5/10*

U.S. Cl. 415—174 **9 Claims**



1. A turbine vane or compressor assembly including:

a plurality of turbine vanes arranged about an axis with each vane extending in a generally radial direction relative to said axis, each of said vanes having an inner end and an outer end;

an inner shroud to which the inner ends of the vanes are secured;

an outer shroud having openings therein through which the outer ends of the vanes project;

a plurality of compressible pads made of metal wire surrounding the outer shroud, each of said pads comprising at least one slot in one surface thereof with the outer end of one of said vanes extending into said slot; and

means surrounding and secured to said outer shroud for holding said pads in position relative to said outer shroud;

said slots being shaped and sized so that the opposite sides of each outer vane end is engaged by said pad and the side edges and the end edge of each outer vane end are in non-engaging relation with said pad.

3,932,057

NOISELESS AIR-ACTUATED TURBINE-TYPE VIBRATOR WITH BLADES ARRANGED IN A SIDEWARDLY EXTENDING ANNULAR PATTERN

Theodore S. Wadensten, P.O. Box 8 - Stilson Road, Wyoming, R.I. 02898

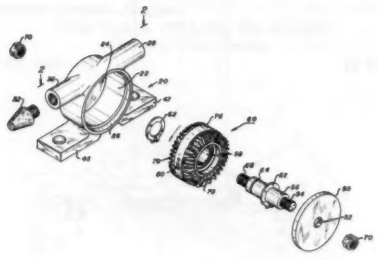
Filed May 8, 1974, Ser. No. 467,915. The portion of the term of this patent subsequent to Mar. 11, 1992, has been disclaimed.

Int. Cl.² B06B *1/16*

U.S. Cl. 415—53 T **12 Claims**

1. A relatively silent, compressed gas-actuated, turbine-type vibrator having a rotor of not less than 1¼ inches and not more than 5½ inches diameter and when operated within a speed range of 6,000 to 10,000 rpms having a noise level not greater than 85 decibels hz., the vibrator including: (a) a substantially closed housing having a cylindrical chamber therein; (b) a dynamically unbalanced rotor freely rotatable in

the cylindrical bore of the chamber, the diameter and length of the rotor being established so that not less than one thirty-second of an inch clearance is provided between the rotor and ends and bore of the chamber, the rotor having a plurality of tooth-like configurations formed on its outer periphery, the tooth-like configuration further having a radial depth which corresponds to a distance not exceeding 7 percent and not less than 1½ percent of the diameter of the rotor, these tooth-like configurations form blades of substantially identical configurations disposed on at least one of the two sides of the rotor and arranged in an annular pattern and extending from its outer periphery a short distance inwardly to terminate short of the other side of the rotor, these teeth disposed at substantially right angles to the plane or rotation of the rotor; (c) an air outlet formed in the housing and extending from the rotor



chamber to the outside of the housing, and (d) an air inlet formed in the housing and extending from the outside of the housing to the rotor chamber, the air inlet arranged to carry this air to at least one side of the rotor chamber and to direct the incoming pressurized air tangentially against the teeth of the mounted rotor and with the tooth-like configuration so formed that in a plane normal to the axis of the rotor the face of the tooth-like configuration against which the incoming air impinges defining an angle of intersection with a theoretical radial line of said rotor, said defined angle being as little as zero and as great as 30° as measured from said point of intersection and inclined in such a direction that the circumferential thickness of the tooth-like configurations tend to decrease as the radial distance from the axis increases, the cross-sectional area of the inlet being 30 to 55 percent of the area of the outlet.

3,932,058

CONTROL SYSTEM FOR VARIABLE PITCH FAN PROPULSOR

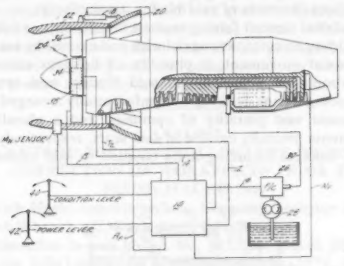
Kermit I. Harner, Windsor, and Roy W. Schneider, Ellington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 7, 1974, Ser. No. 477,532

Int. Cl.² B63H *3/10*; F02C *9/02*; B64C *11/44*

U.S. Cl. 416—28 **11 Claims**

1. A control system for a turbine type of power plant powering a variable pitch propulsor of the type that is closely coupled to the power plant and is supported in a duct bypassing the power plant, said control system including coordinating means for controlling the pitch of the propulsor and the flow of fuel to the power plant, said coordinating means being responsive to a scheduled value of speed derived as a function of flight Mach. No., power plant inlet temperature, power lever position and actual power plant rotational speed for controlling fuel flow to the power plant and being responsive



to said flight Mach. No. and said power lever position to synchronously control the pitch of the propulsor.

3,932,059

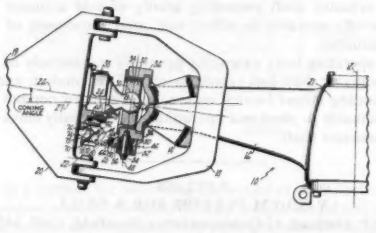
DROOP STOPS FOR HELICOPTER ROTOR HAVING ELASTOMERIC BEARINGS

Robert C. Rybicki, Trumbull, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 10, 1975, Ser. No. 540,309

Int. Cl.² B64C *27/38*

U.S. Cl. 416—140 **11 Claims**



1. Droop stop mechanism for a helicopter rotor head of the type wherein each blade is supported for motion about intersecting pitch, lead-lag, and flapping axes by an elastomeric type bearing mounted between the rotor hub and the blade root attachment comprising:

A. a first support member rotatably mounted to the blade root attachment by bearing means concentric to the pitch axis, including a first flat abutment surface in radial alignment with the pivot of the blade,

B. a second support member rotatably mounted to the rotor hub by bearing means concentric to the rotor head lead-lag axis so as to be engaged by the first support member, including a second flat abutment surface in radial alignment with the pivot of the blade, and

C. alignment means connecting said first and second support members.

3,932,060

BIFILAR VIBRATION DAMPERS

Alan Henry Vincent, and Ronald William Lewis Cure, Yeovil, both of England, assignors to Westland Aircraft Limited, Yeovil, England

Filed Sept. 20, 1974, Ser. No. 507,933

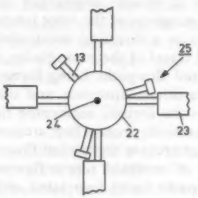
Claims priority, application United Kingdom, Oct. 9, 1973, 47164/73

Int. Cl.² B64C *27/32*

U.S. Cl. 416—145 **8 Claims**

1. A bifilar vibration damper comprising, in combination, a support arm arranged to extend radially from and to be ro-

tated in a plane about an axis of rotation and having two generally semi-circular shaped apertures extending therethrough, said aperture including a radiussed section and a straight section, the radiussed section of each aperture being concentric about parallel axes which are parallel to and equidistant from the axis of rotation, the apertures being located with their radiussed surface furthest from the axis of rotation, a pendulous member of U-shaped cross-section having substantially parallel side portions arranged to be positioned on opposite sides of the support member and spaced so as to define a spacing distance from said support member, each side portion having two generally semi-circular shaped apertures extending therethrough, said apertures including a radiussed section and a straight section, the radiussed section of each aperture being concentric about parallel axes which are parallel to the axis of rotation and being of substantially similar dimension as the support member apertures, the apertures in each side portion being aligned respectively with the apertures of the other side portion and located with their radiussed sections closest to the axis of rotation, said pendulous member being capable of pendulous movement relative to the support arm, a pin member extending through each of the apertures of the support member and the aligned apertures of the side portions to connect the pendulous member to the support member, the pin member being of substantially circular cross-section, a spacer member positioned in each spacing distance, each spacer member having two holes through which the pin members are rotatably positioned so as to support the pin members in operative position, an end plate secured on an outer surface of each side portion over the apertures to retain the pin members in an operative position.



3,932,061

FLUID UNIT ROTOR

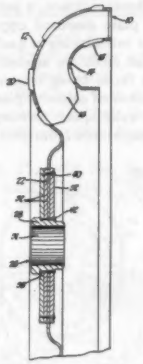
William B. Scott, Plymouth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 286,159, Sept. 5, 1972. This application Sept. 24, 1973, Ser. No. 399,793

Int. Cl. F01d *5/04*

U.S. Cl. 416—180 **2 Claims**

1. A rotor assembly for a hydrodynamic unit comprising a metallic hub member having an enlarged head portion and having an elongated cylindrical shank portion extending medially from said head portion, an annular channel-like shell of sheet metal, a plurality of spaced fluid directing blades, positioned within said shell, fastener means securing said blades to said shell, a flat metal flange integral with said shell and extending radially inwardly therefrom, said flange having a central circular opening which is smaller than said head portion of said hub and which has a diameter slightly greater than the diameter of said shank portion, a plurality of annular metallic connector plates, each of said plates being entirely flat and each having a central circular opening smaller than said head portion and having a diameter slightly greater than the diameter of said shank portion, said flange being mounted on said shank portion sandwiched between said connector plates mounted on said shank portion, first annular electron beam weld means disposed radially outwardly from said head portion and concentric with said shank portion, said first weld means extending completely through said plates and said flange to rigidly secure said flange and said plates together, second annular electron beam weld means to secure said flange and said plates to said shank portion, said second weld means having a diameter substantially equal to the diameter of said circular openings and extending completely through said flange and said connector plates and through a peripheral portion of said shank portion of said hub.



3,932,062

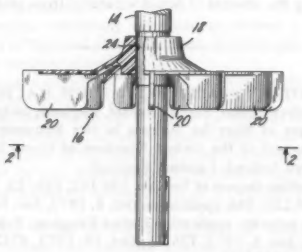
BLOWER BLADE FOR ELECTRIC MOTORS

Hollis D. Sisk, Chesterfield, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Jan. 3, 1975, Ser. No. 538,304

Int. Cl.² F04D *29/28*

U.S. Cl. 416—230 **4 Claims**



1. A blower blade for electric motors comprising from about 50 to about 75% by weight polypropylene, from about 5 to about 10% by weight glass fibers, and from about 15 to about 45% inert filler.

3,932,063

LIQUID RING PUMPS

Denis Victor Butler, Fareham, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed May 8, 1974, Ser. No. 468,166

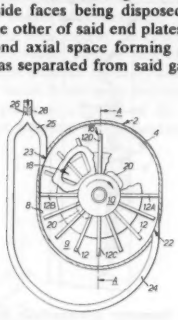
Claims priority, application United Kingdom, May 11, 1973, 22511/73

Int. Cl.² F04C *19/00;* **B01D** *45/00*

U.S. Cl. 417—68 **3 Claims**

1. A liquid ring pump for separating a gas/liquid mixture into gas and liquid comprising, in combination, a housing having a pair of end plates and a sidewall defining a substantially oval chamber within said housing, a rotatable hub disposed within said chamber, a plurality of vanes mounted on said hub and projecting radially outward from said hub, a blocking mass having a pair of side faces disposed in the

interstices between said vanes for partially blocking said interstices, one of said side faces being disposed in spaced-apart relationship with one of said housing end plates to define a radially extending first axial space forming a radially outward flow path for the gas/liquid mixture, a gas/liquid inlet port in said one housing end plate disposed opposite said blocking mass one side face for introducing a gas/liquid mixture into said chamber in an axial direction against said one side face, the other of said side faces being disposed in spaced-apart relationship with the other of said end plates to define a radially extending second axial space forming a radially inward flow path for the gas separated from said gas/liquid mixture,



a gas outlet port in said other housing end plate disposed opposite said blocking mass other side face for discharging gas flowing radially inward in said second axial space, at least one liquid outlet on said housing for receiving separated liquid from said gas/liquid mixture, said liquid passing to said liquid outlet from a liquid ring formed in said chamber during operation of said pump, said blocking mass being effective to raise the stall pressure ratio of said pump thereby increasing its efficiency and to form a we r for preventing the axial migration of liquid from said inlet port to said outlet port thereby increasing the amount of liquid separated from said gas/liquid mixture.

3,932,064

ROTARY BLADED FLUID FLOW MACHINE

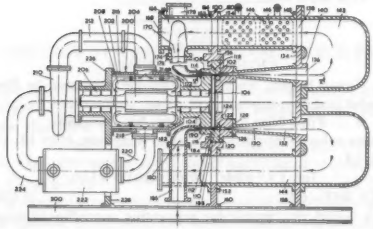
Colin Andrew Millar Tayler, Bristol, England, assignor to The Secretary of State for Defense in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation-in-part of Ser. No. 335,162, Feb. 23, 1973, Pat. No. 3,869,220. This application Oct. 8, 1974, Ser. No. 513,159

Claims priority, application United Kingdom, Feb. 23, 1972, 8278/72; Jan. 5, 1973, 726/73; Oct. 10, 1973, 47422/73; Oct. 10, 1973, 47423/73

Int. Cl.² F04B *23/00*

U.S. Cl. 417—243 **12 Claims**



1. A compressor comprising:

a. a rotor;

b. an annular aperture coaxial with said rotor and surrounding the periphery of said rotor;

c. at least one row of rotor blades circumferentially distributed on the periphery of the rotor and projecting into said annular aperture dividing the annular aperture into an upstream side and a downstream side,

d. a rotor blade passage wherein said row of rotor blades operates and intersecting said annular aperture;

e. a row of downstream stator blades radially directed and circumferentially distributed around the interior of said aperture, disposed adjacent to and downstream of said rotor blades;

f. partitions provided in the annular aperture both upstream and downstream of the rotor blades, each partition downstream of the rotor blades being substantially opposed by a corresponding partition upstream of the rotor blades;

g. a plurality of arcuate segmented flowpaths arranged around the periphery of the rotor intersecting said row of rotor blades in a direction substantially normal to the direction of travel of the rotor blades, each of said arcuate segmented flowpaths being formed between corresponding partitions upstream and downstream of said rotor blades the arcuate segmented flowpaths being arranged successively from a first arcuate segmented flowpath to a last arcuate segmented flowpath;

h. a plurality of confined return flowpaths, each of said return flowpaths being associated with an arcuate segmented flowpath except the last arcuate segmented flowpath, wherein each of the return flowpaths runs from the downstream side of its associated segmented flowpath to the upstream side of the next following arcuate segmented flowpath;

i. an inlet to the first arcuate segmented flowpath;

j. an outlet from the last segmented flowpath;

k. at least one heat exchanger surface provided in at least one of the confined return flowpaths.

3,932,065

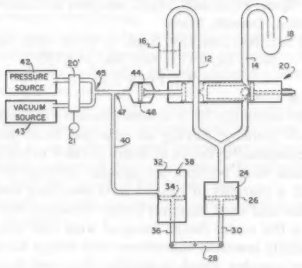
PNEUMATICALLY CONTROLLED LIQUID TRANSFER SYSTEM

Guenter Ginsberg, Miami; Thomas John Godin, Hollywood, and Ronald Olin Simpson, Miami, all of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Division of Ser. No. 382,741, July 26, 1973, Pat. No. 3,882,899. This application Nov. 8, 1974, Ser. No. 522,012

Int. Cl.² F04B *9/00, 9/12, 17/00*

U.S. Cl. 417—317 **10 Claims**



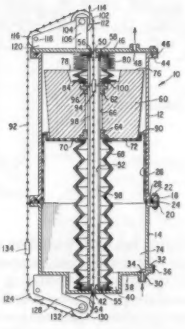
10. A pneumatically controlled liquid transfer system comprising a source of vacuum and pressure, a cylinder including a port and a plunger reciprocable within said cylinder, first and second flexible conduit paths connected to said port and communicatively coupling said port to a source of liquid and to a delivery location respectively, means operably connected to said source of vacuum and pressure for drivingly reciprocating said plunger within said cylinder alternately for drawing of liquid from said source to said cylinder and delivery of

liquid to said delivery location, a make-before-break pinch valve including actuating means therefor, interposed in both said flexible conduit paths for sequentially controlling liquid flow in said paths, means coupling said source of vacuum and pressure to said actuating means for said pinch valve for operation thereof, said pinch valve comprising a pair of pistons sequentially operable within a housing, said pair of flexible conduit paths being disposed respectively in the path of said pistons, one of said conduit paths being normally opened and the other of said conduit paths being normally closed, said actuating means moving in a first direction causing one of said pistons to move in a first direction, and means biasing the other of said pistons in a second direction opposed to the first direction, pressure being applied from said source of vacuum and pressure to said actuating means driving said one piston in said first direction whereby to close the open one of said conduit paths while maintaining the other of said conduit paths in its normally closed condition, thereafter further to move said actuating means in said first direction counteracting the bias on said other piston to open said normally closed other of said conduit paths.

3,932,066
BREATHING GAS DELIVERY CYLINDER FOR RESPIRATORS

Theodore B. Eyrick, Reading, and Allen C. Brown, Acton, both of Mass., assignors to Chemetron Corporation, Chicago, Ill.

Filed Oct. 2, 1973, Ser. No. 402,679
Int. Cl.[2] F04B *17/00, 43/06, 45/02*
U.S. Cl. 417—328 **23 Claims**



1. In a fluid delivery cylinder for delivering at limited positive pressures a selectable, limited volume of fluid at a selectable, limited flowrate:

housing means;

diaphragm means dividing said housing into an upper control chamber and a lower delivery chamber;

guide means extending vertically through and secured to said housing;

fluid delivery drive means within said housing including a weight slidably mounted on said guide means and secured to said diaphragm means for movement therewith;

bellows means connected between said fluid delivery drive means and said guide means to isolate said control chamber from said delivery chamber,

means for producing a vacuum in said control chamber for lifting said drive means to contract said control chamber and expand said delivery chamber to a preselectable volume;

inlet means for admitting fluid into said delivery chamber when said drive means is lifted;

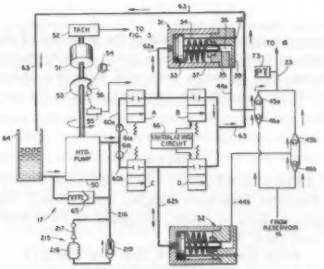
means for releasing said vacuum to lower said drive means and thereby compress said delivery chamber; and

outlet means for discharging fluid from said delivery chamber when said drive means is lowered.

3,932,067
LIQUID CHROMATOGRAPHY APPARATUS AND METHOD

Dean M. Ball; Ronnie W. Camp, both of Norcross; Warren P. Hendrix, Lawrenceville, and Clyde Orr, Jr., Atlanta, all of Ga., assignors to Micromeritics Instrument Corporation, Norcross, Ga.

Filed Feb. 27, 1974, Ser. No. 446,293
Int. Cl.[2] F04B *17/00*
U.S. Cl. 417—339 **28 Claims**



1. Apparatus for delivering a substantially pulseless flow of liquid, comprising:

first means selectively operative to deliver a certain amount of liquid at either a certain constant rate of flow or at a constant pressure;

second means selectively operative to deliver a certain amount of liquid at either a certain constant rate of flow or at a constant pressure;

passage means connected to receive the liquid delivered by each of said first and second means;

control means operatively coupled to operate said first means to deliver liquid at a certain constant rate of flow, and responsive to the delivery of a predetermined amount of liquid by said first means to commence operation of said first means to deliver liquid at a constant pressure; and

said control means operatively coupled to operate said second means and operative to commence operation of said second means to deliver liquid at said constant pressure while said first means is delivering liquid at constant pressure.

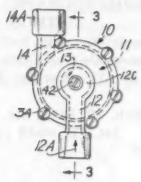
3,932,068
MAGNETICALLY-COUPLED PUMP

Frederick N. Zimmermann, Deerfield, Ill., assignor to March Manufacturing Company, Glenview, Ill.

Continuation of Ser. No. 584,171, Oct. 4, 1966, abandoned. This application July 7, 1969, Ser. No. 845,634
Int. Cl. F04b *17/00, 35/04*
U.S. Cl. 417—420 **13 Claims**

1. In a centrifugal pump of the magnetically-coupled type including a pump housing with inlet and outlet passages for an impeller having a coupling magnet rotatable therewith and adapted to be driven by an annular circumambient driving magnet disposed exteriorly of the housing, a housing structure adapted for fabrication by molding from either metallic or non-metallic moldable materials and comprising first and second body members joinable to form a closed pump housing including an impeller chamber and a magnet well opening only into said chamber and extending away therefrom in axial

alignment with the axis of rotation of the impeller; impeller means having a hub portion adapted to be disposed in said well and impeller formations adapted to rotate in said chamber; a driven magnet affixed to said hub portion and rotatable therewith in the well; shaft means for the impeller means and



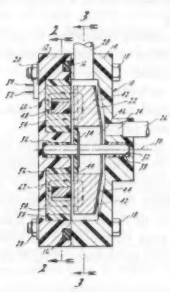
comprising an integral projection of the material of one of said body members extending from a point of conjunction therewith a substantial distance into said impeller chamber and magnet well to support the impeller means for rotation as aforesaid.

3,932,069

VARIABLE RELUCTANCE MOTOR PUMP

Dante S. Giardini, Dearborn Heights, and Lewis E. Unnewehr, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1974, Ser. No. 534,512
Int. Cl.[2] F04D *13/02*
U.S. Cl. 417—420 **1 Claim**



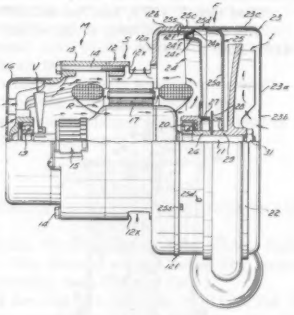
1. A motor pump comprising, in combination:
a housing defining a substantially cylindrical enclosed chamber, the axis of said cylindrical chamber being the axis of rotation of said motor pump, said housing having a fluid inlet passage and a fluid outlet passage, said outlet passage being located at or near the radially outer portion of said chamber;
a shaft journalled for rotation in said housing;
a stator for said motor pump, said stator being mounted in said housing and comprising an electrical coil having a plurality of turns, said axis of said chamber also being the axis of said coil, a plurality of U-shaped stator elements made from a ferromagnetic material, said U-shaped elements being equally spaced from one another and each having one of its legs located on the radially inner side of said coil and its other leg located on the radially outer side of said coil, said coil and said U-shaped elements being supported in said housing; and
a rotor assembly attached to said shaft for rotation therewith in a position axially adjacent to, and on one side of said stator, said rotor assembly comprising a support structure made from a nonmagnetic material and a plurality of rotor ferromagnetic elements, said support structure including a disc and a washer-shaped member spaced from one another along the axis of said shaft, said disc being secured to said shaft and said rotor ferromagnetic element being located between said disc and said member, said rotor ferromagnetic elements being positioned in equally-spaced locations in said support structure to permit them alternately to come into and go out of axial alignment with said U-shaped stator ferromagnetic elements when said shaft and rotor assembly are rotated, said rotor assembly having radially extending passages between said rotor ferromagnetic elements, each of said radially extending passages being bounded by said disc, by said member and by two of said rotor ferrromagnetic elements, said passages permitting fluid flow therethrough from said housing inlet passage to said housing outlet passage upon the application of suitable electrical current to said electrical coil.

3,932,070

ELECTRIC MOTOR FAN UNIT FOR WET WORKING AIR

John H. Porter, Talmadge, and Robert O. Swift, Stow, both of Ohio, assignors to Ametek, Inc., New York, N.Y.

Filed Feb. 26, 1974, Ser. No. 445,989
Int. Cl.[2] F04B *17/00*
U.S. Cl. 417—423 A **14 Claims**



1. In an electric motor fan unit, including an electric motor section having motor frame structure, supporting and enclosing rotor and stator structure, a ventilating fan on the rotor shaft, with motor ventilating air passages defined therethrough between motor frame portions open near one end and at the other end respectively for discharge and intake of ventilating air,
said frame structure at said one end including a motor end bracket member
having a central structure providing a socket with a bearing therein for the rotor shaft extending therethrough and
having an end rim portion,
and said unit further including
a fan section having therein a main working air impeller clamped outboard on a shaft portion extending through said bearing and a fan housing structure including housing shell means providing an outer end wall centrally apertured to form an axial working air inlet to said main impeller and a further wall circumferentially surrounding the said main impeller,
said housing shell means having therein main air outlet means and having an open end supported on said end rim portion,
that improvement comprising:
partition means mounted to said end bracket member and forming an inmost end wall and an intermediate wall of said housing structure,

said inmost end wall centrally apertured and fitted to an outboard portion of said central structure and providing an end closure for the motor frame structure, said intermediate wall having a central aperture with said shaft extended therethrough and defining with said outer and inmost end walls respectively an outer, main impeller chamber and an inner chamber;

a centrifugal slinger disk secured on said shaft in said inner chamber;

said inner chamber as a slinger chamber having vent openings in a circumferential wall portion thereof; and

bearing shielding tubular flange means in coaxially spaced relation to the extending shaft portion, and projecting from said central structure, beyond the centrally apertured portion of the inmost end wall, and into close running end clearance with said slinger disk;

whereby water and other material entrained in working air entering the impeller chamber

is inhibited from entering the inner chamber, and any such material entering the inner chamber along the shaft structure is prevented from access to the bearing by the cooperating bearing shielding flange and slinger disk, and

the region of the motor section including said bearing is thermally insulated by said inner chamber from warm humid working air in the outer chamber.

3,932,071

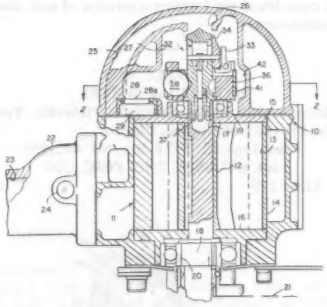
OVERSPEED SAFTEY CONTROL MECHANISM FOR ROTARY TOOLS

Raymond J. Schaedler, New Hartford, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Aug. 28, 1974, Ser. No. 501,464

Int. Cl.² F01C *21/12*; G05D *13/10*

U.S. Cl. 418—43 **6 Claims**



1. In a tool including a rotary air motor having a rotor shaft, an inlet port for admitting operating air to drive the rotor, a circular body axially mounted to the shaft for rotation with the latter, said body member having a radial hole in its periphery, a ball valve slidably received in the hole and adapted to be centrifugally expelled from the hole upon the motor developing centrifugal force of a certain value, track means for receiving the expelled ball valve and guiding it into closing relation with the inlet port, and means fitted in the inlet port for retaining the ball valve in said closing relation.

3,932,072

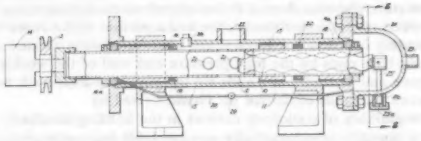
MOINEAU PUMP WITH ROTATING OUTER MEMBER

Wallace Clark, 1830 S. German Church Road, Indianapolis, Ind. 46239

Continuation-in-part of Ser. No. 411,162, Oct. 30, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 504,354

Int. Cl.² F01C *1/10*; F04C *1/06*; F16C *25/00*, *3/14*

U.S. Cl. 418—48 **4 Claims**



1. A pump constituted of a gear pair made up of an inner member having at least one external helical thread, and an outer member having internal helical threads, there being one more internal helical thread in the outer member than the number of external helical threads on the inner member, a radial arm non-rotatably secured at one of its ends to said inner member, and fixed means limiting the other end of said radial arm to reciprocatory and oscillatory motion, said outer member being free to rotate on its true axis, said outer member being fixed in a tubular casing extending beyond said inner and outer members and constituting a drive shaft, said casing having at least one aperture for the passage of fluid being pumped, and being disposed within a housing, said casing being supported for rotation within said housing in bearings, said housing having a port at each end of said gear pair, whereby the direction of pumping may be reversed by reversing the direction of rotation of said drive shaft.

3,932,073

SCREW ROTOR MACHINE WITH SPRING AND FLUID BIASED BALANCING PISTONS

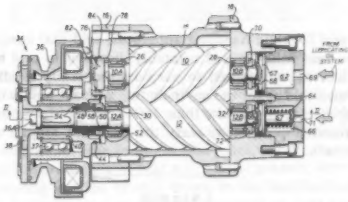
Hjalmar Schibbye, Saltsjo-Boo, and Arnold Englund, Vallingby, both of Sweden, assignors to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

Filed July 1, 1974, Ser. No. 484,983

Claims priority, application United Kingdom, July 5, 1973, 32126/73

Int. Cl.² F01C *1/16*; F04C *17/12*; F01C *21/04*

U.S. Cl. 418—97 **8 Claims**



1. A screw rotor machine comprising a housing structure including a barrel portion having intersecting bores with coplanar axes forming a working space extending longitudinally of the barrel portion which has a high pressure end wall, the structure having a low pressure port communicating with one end of the working space the major portion of which port is located at one side of the plane of the axes of the intersecting bores and a high pressure port communicating with the other and high pressure end of the working space the major portion of which port is located at the oppsoite side of said plane, and male and female rotors rotatably mounted in the respective

bores and having meshing helical lands and grooves with an effective wrap angle of less than 360°, the lands of the male rotor having substantially convexly curved flanks and intervening grooves the major portions of which are outside the pitch circle of the male rotor and the lands of the female rotor having substantially concavely curved flanks and intervening grooves the major portions of which lie inside the pitch circle of the female rotor, the lands and grooves of the rotors intermeshing to form with confronting portions of said housing structure chevron-shaped closed chambers each comprising a portion of the male rotor groove and a portion of the communicating female rotor groove, the chambers being defined at their base ends by the high pressure end wall of the working space and at their apex ends by the places of intermesh between the lands of the rotors, characterized by

a plurality of stationary cavities in the housing structure;

a plurality of substantially non-rotatable balancing pistons slideably mounted to respective ones of said stationary cavities in the housing structure and each balancing piston being associated with a respective rotor;

pressure fluid means coupled to said stationary cavities for biassing said balancing pistons so as to impose a biassing force on their respective rotors to bias the respective rotors in a direction towards the high pressure end wall of the housing structure, at least a part of the said end wall comrpising a thrust bearing surface for the rotor;

at least one spring mechanically biassing at least one of said balancing pistons in the same direction as said pressure fluid means; and

a plurality of axial bearings, each connecting a respective rotor to its associated balancing piston, said bearings each including a non-rotatable part coupled to a respective balancing piston and supporting sealing means slideably engaging the inner wall of the respective stationary cavity.

3,932,074

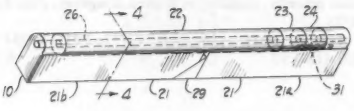
SEAL FOR ROTARY FLUID-HANDLING APPARATUS

James C. Morris, 105 Beedle Circle, Pleasant Hills, Pa. 15236

Filed May 14, 1973, Ser. No. 359,785

Int. Cl.² F16J 15/54

U.S. Cl. 418—113 **8 Claims**



1. A seal for fluid-handling apparatus, said seal comprising a holder, and roller means rotatably disposed in said holder, said holder being adapted to vary automatically in effective length, and said roller means including at least one extension cam disposed to rotate less than 360° with respect to its most fully extended position to vary the effective length of said roller means.

3,932,075

ROTOR AND SEALING GRID FOR ROTARY ENGINES

Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Mar. 21, 1975, Ser. No. 560,870

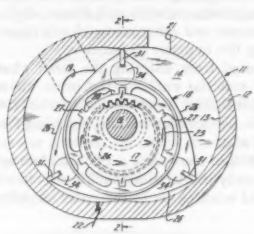
Int. Cl.² F01C 19/08, 19/02

U.S. Cl. 418—121 **7 Claims**

1. A rotary mechanism having a housing with a peripheral wall having a multilobed inner surface and a pair of axially spaced side walls defining an inner cavity having a longitudinal axis, a generally polygonal rotor with a plurality of apex portions and having axially spaced side faces mounted within the cavity for rotation about a rotor axis parallel to and spaced apart from the housing axis, the rotor axis planetating about the housing axis, the rotor having a working face between each adjacent pair of apex portions and forming with the housing walls a plurality of working chambers of variable volume, wherein the improvement comprises:

a. the rotor having a slot therein at each apex portion extending axially from one side face to the other, and an apex sealing bar disposed in each apex slot and projecting radially therefrom and in sealing engagement with the inner surface of the peripheral housing walls and having its ends in sealing engagement with the adjacent side walls;

b. each rotor side face having a blind bore therein at each apex portion, each blind bore having disposed therein a cylindrical pin having a slot in its outermost periphery in



the axial direction, the slot in the pin being aligned with the apex slot in the rotor and receiving a portion of the sealing bar;

c. each side face of the rotor having a circular groove therein coaxial with the rotor, and a circular side sealing member disposed in the circular groove and in sealing relation with the adjacent side wall and with an inner portion of said cylindrical pin;

d. the apex sealing bars and cylindrical pins and circular side seals all coacting and comprising a sealing grid isolating and sealing all the working chambers from one another said inner portion of said cylindrical pin and the innermost end of said apex seal being radially spaced and said cylindrical pin forming a portion of said sealing grid therebetween.

3,932,076

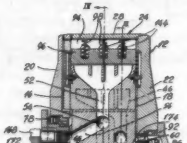
HYDRAULIC WHEEL

Olida Thibault, 390 De La Briquade, Plainville, Terrebonne County, Province of Quebec, Canada

Filed June 25, 1974, Ser. No. 482,991

Int. Cl.² B60K 7/00; F04C 1/00

U.S. Cl. 418—177 **15 Claims**



1. A hydraulic energy converting device comprising: a stator and a rotor, said rotor enclosing said stator; said stator having flat side surfaces and a peripheral camming surface; said rotor comprising a pair of cover plates having flat inner surfaces located adjacent to said stator side surfaces, and a guide ring means extending between and joining said cover

plates at the periphery thereof; a power ring having a cylindrical inner surface facing said stator camming surface and defining therewith a plurality of successive working chambers; means in said stator to feed pressure fluid at one end of each chamber and further means in said stator to exhaust said fluid from an opposite end of each chamber; a plurality of vanes mounted in said rotor power ring radially with respect to said stator and resilient means biassing said vanes into said working chambers and against said stator camming surface, said vanes separating said working chambers into at least two sections whereby pressure fluid entering said chambers through said inlets engages said vanes successively and impart rotary motion to said rotor and then exhausts through said outlets; sealing means to hinder pressure fluid from said chambers to flow between said rotor and stator flat surfaces, said sealing means comprising: means defining first annular grooves, one in each of said cover plate inner surfaces, said grooves being located to overlap adjacent side surfaces of said power ring and stator; annular sealing pistons in said grooves sealingly closing said grooves and defining therewith and with said cover plates enclosed pressure chambers; means defining second annular grooves, one in each of said stator side surfaces; said second grooves being narrower than, and facing, said first grooves; and communication means between said enclosed chambers, said second grooves and said working chambers whereby pressure fluid from said working chambers creates pressure forces in each of said enclosed chambers greater than those in the opposed second grooves thereby resulting in pressure differentials pressing said sealing pistons against said stator side surfaces and said power ring.

3,932,077

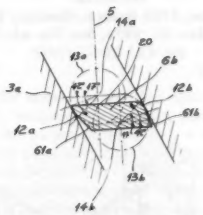
ROTARY INTERENGAGING WORM AND WORM WHEEL WITH SPECIFIC TOOTH SHAPE

Bernard Zimmern, 27, rue Delabordere, Neuilly-sur-Seine (Hauts de Seine), France (92200)

Continuation of Ser. No. 341,791, March 15, 1973, abandoned. This application Sept. 18, 1974, Ser. No. 507,052

Int. Cl.[2] F01C *1/08;* **F04C** *17/04*

U.S. Cl. 418—195 **7 Claims**



1. A machine for the compression or expansion of a fluid comprising a rotor mounted for rotation about an axis and provided with at least one thread disposed in a helix and forming a projection, the crest of said thread being disposed on a surface of revolution with respect to the axis of the rotor and so arranged as to cooperate with substantially fluid-tight manner with a stationary casing which surrounds the rotor at least to a partial extent, at least one sealing worm-wheel mounted to rotate about an axis which is located transversely with respect to the axis of the rotor and provided with teeth which advance into and out of root-crest meshing relation with the rotor thread within said housing thereby to establish a root-crest gap during movement of said teeth into and out of said housing, one face of each aforesaid tooth in meshing relation with the rotor thread being exposed to the high pressure fluid, wherein portions of each tooth-flank of the sealing worm-wheel are portions of surfaces of revolution, axes of which are distinct and generally parallel to said one tooth face which is exposed to the high pressure fluid, wherein said portions of flanks include those zones of the flanks which come into contact with the thread during the movement of rotation of the rotor, and wherein those zones are adjacent to the tooth-face which is exposed to the high-pressure fluid.

3,932,078

APPARATUS FOR MANUFACTURING POWER TRANSMISSION BELTING

Robert C. Ellis, Denver; James C. Vance, Sr., Sedalia; Sterling Van Gundy, and Donald R. Walcher, both of Denver, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Mar. 13, 1975, Ser. No. 558,048

Int. Cl.[2] B29H *7/22;* **B29D** *29/00*

U.S. Cl. 425—28 B **3 Claims**

1. An apparatus for making power transmission belting from an uncured body comprising:

a cylindrical mold member having generally parallel open ends;

a generally cylindrically shaped bladder with inwardly curved end portions, the bladder disposed in the mold with the curved end portions generally juxtaposed the open ends of the mold member;

two disk members, each having a smoothly curved circumferential concave portion on one side that extends to near it rim, the disk members disposed near each end of the mold member with their concave portions facing each other, the concave portions defining a generally smooth transition between the mold member and disk members;

closure plates disposed over the ends of the mold;

press means for selectively holding the closure plates in position over the ends of the mold; and

means for admitting and rejecting pressurized fluid to and from the bladder.

3,932,079

PNEUMATIC TIRE VULCANIZING APPARATUS

Valery Leonidovich Legostaev; Oleg Eduardovich Nadzharov; Albert Vasilievich Fedorov, and Ivan Ivanovich Kruglov, all of Tambov, U.S.S.R.

Filed Jan. 29, 1975, Ser. No. 545,316

Int. Cl.[2] B29H *5/02, 5/08*

U.S. Cl. 425—32 **1 Claim**

1. Pneumatic tire vulcanizing apparatus comprising a series of tire curing presses arranged in a longitudinal row; mold assemblies of said presses, each including a top mold section and a bottom mold section; manipulator for reloading said mold assemblies; the frame of said manipulator, mounted for motion longitudinally of said row of said presses; drive means for effecting motion of said frame in the longitudinal direction; a mold opening mechanism mounted on said frame; the cross beam of said mold opening mechanism; drive means for effecting motion of said cross beam vertically and transversely of said row of said presses; clamp means for clamping said top mold sections, mounted on said cross beam; mechanism for loading green tires into said bottom mold sections, mounted on said frame; the carriage of said tire loading mechanism, movable in a direction transverse of said row of said presses; a green tire holder mounted on said carriage; drive means for reciprocating said green tire holder vertically; two side jaws mounted on said carriage, each having a closed-end vertical groove; follower means mounted on said cross beam for cooperation with said vertical grooves, whereby there is provided independent motion of said cross beam with respect to said

carriage in a vertical direction and joint motion of said carriage and said cross beam, as the latter is driven in a direction transverse of said row of said presses.

3,932,080

APPARATUS FOR MANUFACTURE OF TUBULAR FILM FROM THERMOPLASTIC RESIN

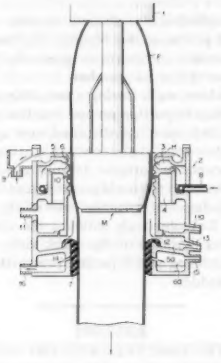
Osamu Uemura; Kiyoshi Fujita, both of Yokohama, and Takeshi Onoda, Hiratsuka, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 330,234, Feb. 7, 1973, Pat. No. 3,886,243. This application Aug. 28, 1974, Ser. No. 501,236

Claims priority, application Japan, Feb. 15, 1972, 47-15251; Feb. 15, 1972, 47-17955

Int. Cl.² B29C *17/00*

U.S. Cl. 425—71 4 Claims



1. Apparatus for manufacture of tubular film from thermoplastic resin comprising:

A. an extruder provided with an annular die for substantially downward extrusion of thermoplastic resin in the form of a tubular film;

B. means for supplying a prescribed volume of air to inflate said tubular film;

C. a cylindrical mandrel positioned below said die for internally cooling said tubular film;

D. a cylindrical water cooler, concentric with said mandrel, provided with vacuum sizing means for externally cooling and sizing said tubular film,

E. said cooler having:

a. an annular cooling water reservoir disposed at the upper part of said cooler,

b. an annular cap member covering said cooling water reservoir, the upper surface of the cap member acting as a weir to fix the level of an upward stream of water contacting the external surface of said tubular film,

c. an annular vacuum sizing chamber positioned below said cooling water reservoir and provided with a plurality of air sucking ports for sizing said tubular film,

d. a cooling water inlet into an annular passageway below said cap member and above said chamber for providing water to produce a first stream of water upwardly to said cap member and a second stream of water downwardly past said chamber with both streams contacting the external surface of said tubular film,

e. an annular cooling water outlet below said chamber for discharge of water flowing in said second stream of water, and

f. annular vacuum suction means for removing residual water from said tubular film below said water outlet.

3,932,081

EXTRUDER NOZZLE FOR SHAPING A PULP TO FORM SMOKABLE STRANDS OR FIBERS

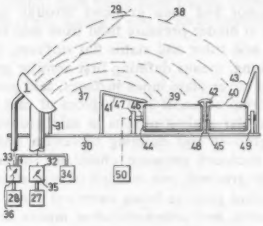
Paul Buchmann, Basel, Switzerland; Monique Beringer, Saint Louis, France, and Heinz Spörri, Birsfelden, Switzerland, assignors to Tamag/Basel AG, Basel, Switzerland

Filed Dec. 17, 1973, Ser. No. 425,134

Claims priority, application Luxemburg, Dec. 22, 1972, 66740

Int. Cl.² A24B *3/14;* B29D *31/00*

U.S. Cl. 425—72 10 Claims



1. In an apparatus for the formation of smokeable fibers the improvement which comprises an extruder nozzle having a nozzle surface formed with a plurality of extrusion orifices and interspersed with said orifices; a multiplicity of gas-outlet openings interspersed with said orifices and coplanar therewith, a plurality of said openings surrounding each orifice; means for forcing an extrudable smokeable composition through said orifices to form discrete strands; and means for supplying a compressed gas to said openings to produce a gas flow codirectionally with and along said strands breaking the same into fibers by tearing said strands from said orifices in the direction in which the strands are extruded.

3,932,082

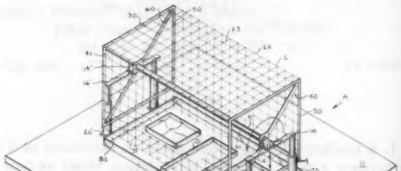
MEANS FOR FORMING A REINFORCED CONCRETE MODULE

Samuel W. Beaman, 4780 Branch, Houston, Tex. 77021

Filed Jan. 21, 1974, Ser. No. 434,788

Int. Cl.² E04G *11/02*

U.S. Cl. 425—125 6 Claims



1. An apparatus for use in forming reinforced concrete modular construction units, comprising:

a. support means;

b. a shaft mounted with said support means for rotational movement with respect thereto;

c. cage means mounted on said shaft for movement therewith for forming a plurality of concrete receiving surfaces of concrete reinforcing material about which concrete is cast, each of said surfaces with concrete cast thereon

forming an integral part of a modular construction unit; and

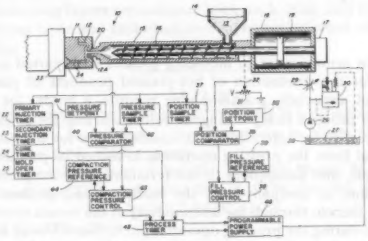
d. a vertical positioning means mounted with said support means for moving said support means and shaft vertically to adjust the vertical position of said cage means surfaces between lower position in which concrete is cast about said surfaces and an upper position in which said shaft is rotated, so that by selective rotation and vertical positioning, said cage means surfaces are positioned for casting concrete on each of said surfaces to form a reinforced concrete modular construction unit.

3,932,083

INJECTION MOLDING CONTROL

Jon E. Boettner, Owens Township, Winnebago County, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Division of Ser. No. 421,115, Dec. 3, 1973. This application Nov. 29, 1974, Ser. No. 528,213
Int. Cl.² B29F *1/02, 1/022, 1/06*
U.S. Cl. 425—145 **5 Claims**



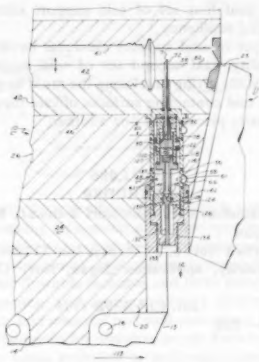
1. An automatic control system for injection molding machines having a reciprocable ram for injecting plasticized materials from an extrusion barrel into a mold cavity, said system comprising a position transducer producing a position signal varying with the position of the ram, a position setpoint means establishing a position setpoint signal, a position sample timer producing a position sample signal at a predetermined time after initiation of an injection cycle, a position comparator supplying a position deviation signal in response to deviation of said position signal from the position setpont signal upon occurrence of said position sample signal, means for adjusting a fill pressure in compliance with the position deviation signal to compensate for said position deviation, a pressure transducer producing a pressure signal varying with the pressure in said mold cavity, a pressure setpoint means establishing a pressure setpoint signal, a pressure sample timer producing a pressure sample signal at a predetermined second time after initiation of the injection cycle, a pressure comparator supplying a pressure deviation signal in response to deviation of said pressure signal from the pressure setpoint signal upon occurrence of said pressure sample signal, and means for adjusting a compaction pressure in compliance with the pressure deviation signal to compensate for said pressure deviation, said position sample signal being produced prior to completion of filling of the mold cavity, and said pressure sample signal being produced after completion of filling of the mold cavity.

3,932,084

BLOW NEEDLE ASSEMBLY

Joseph R. Reilly, Naugatuck, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 16, 1974, Ser. No. 533,238
Int. Cl.² B29D *23/02*
U.S. Cl. 425—182 **13 Claims**



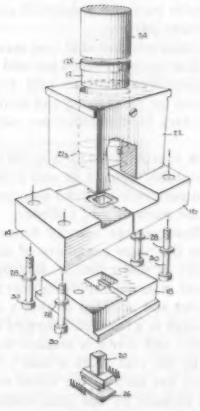
1. In a needle assembly including piston means carrying a hollow needle slidably reciprocable with respect to a cavity portion of a blow mold, the improvement which comprises, in combination, means accessible through said needle for releasably securing said needle to said piston means.

3,932,085

MOLD BASE

Stephen Horbach, 40 Glen Road, Mountain Lakes, N.J. 07046

Filed July 17, 1974, Ser. No. 489,428
Int. Cl.² B28B *7/00*
U.S. Cl. 425—186 **28 Claims**



1. In a mold base, the improvement adapting said mold base for long life use with abrasive molding material comprising:

a frame,

at least two tungsten carbide mold cavity pieces, at least a first one of said mold cavity pieces being above a parting line and at least a second one of said mold cavity pieces being below a parting line, said mold cavity pieces having

surfaces in contact with one another when the mold base is closed,

a plurality of support elements supporting said mold cavity pieces within said frame,

said support elements comprising a material substantially softer than tungsten carbide, said support elements being the sole force transmitting elements in contact with said mold cavity pieces,

a first set of said support elements receiving the energy of impact on closing the mold to absorb and dissipate said energy, said first set of said support elements having substantial resilliency,

a second set of said support elements having substantial malleability, said second set of said support elements mechanically giving on closing the mold to provide alignment of said contacting surfaces of said tungsten carbide mold cavity pieces with one another.

3,932,086
EXTRUDER

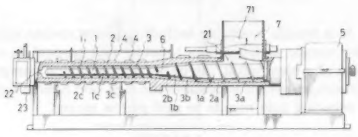
Tadashi Kasamatsu, 6-10, Shiratori 2-chome, Katsushikaku, Tokyo, Japan

Filed Nov. 6, 1974, Ser. No. 521,542

Claims priority, application Japan, Nov. 13, 1973, 48-130414[U]

Int. Cl.² B29B *1/04*

U.S. Cl. 425—208 **8 Claims**



1. An extruder comprising:

a. a cylinder which has a front tubular part, rear tubular part and an intermediate part between said front tubular part and said rear tubular part and is provided with a material supplying port for supplying a material at a periphery of said rear tubular part and a material extruding outlet at said front tubular part;

b. pulverizing means positioned at said material supply port, which pulverizes primary materials and feeds pulverized materials under pressure into said material supplying port, said means for pulverizing and feeding the materials comprising rotary blades which are edged at the blade ends;

c. a screw which is provided with a spiral ridge on its outer periphery, rotatably housed in said cylinder, said screw having a front part, rear part and intermediate part corresponding to the parts of said cylinder;

d. a material flow passage spirally formed by said spiral ridge between the outer periphery of said screw and the inner periphery of said cylinder, said passage communicating with said material supplying port and said material extruding outlet and adapted so that a capacity per turn of the spiral ridge in a front part formed by the front parts of said cylinder and screw is smaller than that of a rear part formed by the rear parts of said cylinder and screw and a capacity per turn of the spiral ridge in a passage throttle part formed by the intermediate parts of said cylinder and screw gradually decreases as said spiral ridge advances from the rear side to the front side;

e. a communicating path connecting adjacent partial sections of said material flow passage which are separated by said spiral ridge in said passage throttle part;

f. a rotary driving means which rotates said screw; and

g. a heating means provided on said cylinder to heat said material flow passage.

3,932,087
ARRANGEMENT IN MOULDING PRESSES WITH PARTED PRESS TOOLS FOR THE PRODUCTION OF HOT-PRESSED PLASTIC MATERIAL PRODUCTS, ESPECIALLY GRAMMOPHONE RECORDS

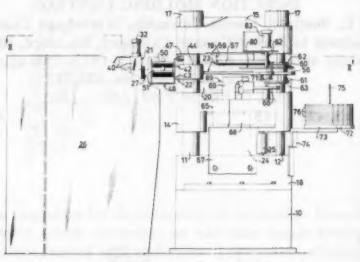
Östen Karl Alf Nilsson, Spanga, and Curt Lindell, Taby, both of Sweden, assignors to Toolex Alpha Aktiebolag, Sundbyberg, Sweden

Filed Jan. 2, 1975, Ser. No. 538,208

Claims priority, application Sweden, Jan. 7, 1974, 7400162; Dec. 19, 1974, 7416026

Int. Cl.² B29D *17/00*

U.S. Cl. 425—215 **20 Claims**



1. An arrangement in moulding presses with parted press tools for the production of hot-pressed products of plastic material, especially grammophone records, a holder for the pressed product being arranged, before starting the pressing operation to be entered into an exuding zone for the excess material from the pressing operation to assure its position in the press, and subsequent to the termination of the pressing operation, in company with the ready-pressed product attached thereto through the intermediary of the excess material exuded during the pressing operation, to be moved away to an apparatus for releasing the ready-pressed product from the holder, situated outside the pressing area, characterized in that the holder presents a ring, encircling at least the major portion of the perimeter of the pressed product, comprising a plurality of anchoring means distributed in and along the exuding zone of the excess material for attaching the pressed product to the holder by the excess material exuding onto, and solidifying in engagement with said anchoring means, and that said apparatus includes a shearing means, movable essentially transverse to the plane of the ring of anchoring means, for breaking the pressed product loose in the region of said anchoring means.

3,932,088
FLEXIBLE ANNULAR CORE USED FOR THE PRODUCTION OF HOLLOW TOROIDAL RUBBER SHELLS

Jumei Harada; Kenji Tsukamoto, both of Higashi-Murayama; Tetsuhiko Migita, Kodaira, and Tsutomu Matsunaga, Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed July 31, 1974, Ser. No. 493,434

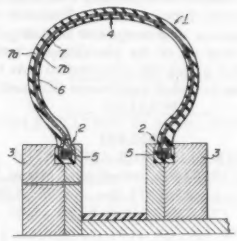
Claims priority, application Japan, Aug. 7, 1973, 48-87972

Int. Cl.² B29C *1/00, 5/00;* **B29F** *1/00;* **B29H** *5/04, 5/18*

U.S. Cl. 425—242 **9 Claims**

1. A flexible annular core used for the production of hollow toroidal rubber shells comprising, a pair of bead portions and a flexible shell portion, each of said bead portions having beads which are looped in a circumferential direction of the core in an inextensible fashion, at least one reinforcing layer reinforced with cords inextensible in the lengthwise direction thereof and folded back so as to enclose the beads, said flexible shell portion being comprised of said reinforcing layer and

elastomer layers covering both sides of the reinforcing layer and extending across a pair of the bead portions, said core being fixed at its bead portions to movable ring molds which can be moved to and fro and deformed by the movable ring molds so as to deform repeatedly the flexible shell portion in a reversible manner between a cylindrical shape at the largest distance of the movable ring molds and a toroidal shape at the



shortest distance of the molds, said bead portions fixed to the movable ring molds being composed of said reinforcing layers adhered with each other and said reinforcing layer and said elastomer layer adhered with each other to form an integral body, and said flexible shell portion being composed of said reinforcing layers not adhered with each other and said reinforcing layer and said elastomer layer not adhered with each other.

3,932,089

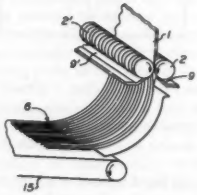
APPARATUS FOR MANUFACTURING WAVED NOODLES

Momofuku Ando, Osaka, Japan, assignor to Nissin Shokuhin Kaisha, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 128,382, March 26, 1971, abandoned. This application Feb. 8, 1974, Ser. No. 440,675

Int. Cl.² A21C *11/24*

U.S. Cl. 425—294 **3 Claims**



1. An apparatus for making noodles comprising a pair of oppositely rotating rollers adapted to receive a dough strip between them, said rollers being formed with transversely spaced circumferential grooves registering with one another to form cavities of large cross section and lands between said grooves and outwardly thereof, the lands outwardly of said grooves contacting each other at the nip of the rollers and the lands between said grooves being formed with circumferentially spaced recesses interconnecting the grooves and of a smaller cross section than said grooves; means for feeding a dough strip between said rollers whereby the dough of said strip is passed into said grooves and recesses to form noodles, consisting of at least two transversely spaced large cross section portions corresponding to said grooves and transverse connecting portions corresponding to said recesses, said grooves and said recesses being of semicircular cross section and said rollers being cylindrical, each of said rollers being provided with cavities extending radially inwardly from the respective grooves; and

comb means reaching into said cavities.

3,932,090

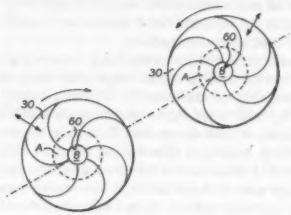
ADJUSTABLE EXTRUSION APPARATUS FOR PRODUCING THREAD-LIKE PRODUCTS

George C. Brumlik, Montclair, N.J., assignor to Ingrip Fasteners, Inc., New York, N.Y.

Filed Jan. 31, 1973, Ser. No. 328,203

Int. Cl.² B29F *3/04*; B29D *1/00*

U.S. Cl. 425—381 **3 Claims**



1. Apparatus for extruding articles which comprises extrusion means having an annular extrusion opening divided into an outer extrusion zone and an inner extrusion zone contiguous with the outer zone, said extrusion means being adapted to melt a melt flowable material and force same through said extrusion opening, said inner zone being adapted to continuously extrude said material and said outer zone having means associated therewith for simultaneously forming a thread in the material being extruded in said outer zone said thread forming means including means for simultaneously forming biased means on one or more of the edge, face or trough of the thread formed in the material being extruded in said outer zone.

3,932,091

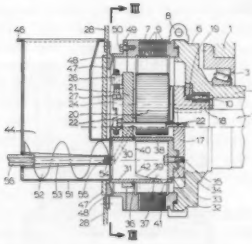
PELLET MILL WITH SEPARATE FEE MEANS FOR EACH DIE ROLLER

Johannes Albertus Vink, Bisschopswater 17, Breukelen, Netherlands

Filed Jan. 28, 1975, Ser. No. 544,699

Int. Cl.² A23N *17/00*; B29F *3/012*

U.S. Cl. 425—331 **12 Claims**



1. A pellet mill for making pellets from flour products or similar material, comprising

a frame,

a first horizontally extending hollow drive shaft mounted for rotation in said frame and having two ends,

an annular die member mounted coaxially on said first drive shaft at one of said ends thereof, said annular die having an inner cylindrical surface and a plurality of radial die openings extending through the annular body of said die, said annular die enclosing an interior die space open at the side of the die removed from said drive shaft,

an extrusion roller assembly including a plurality of extrusion rollers arranged in spaced relationship in the interior of said annular die for cooperation with said cylindrical inner surface thereof, and a common roller frame supporting each of said rollers for free rotation,

a second shaft extending through said first hollow drive shaft and having two ends, said roller frame being secured to one end of said second shaft, bearing means rotatably supporting said second shaft, shear pin means connecting said second shaft to said frame for holding said second shaft stationary during normal operating conditions of the mill, and

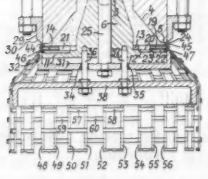
a feed assembly for feeding the material to be pelleted to the interior of said annular die, said feed assembly including a plurality of separate feed means one associated with each of said extrusion rollers,

each of said feed means comprising conveying means for said material having a discharge end situated opposite said open side of said annular die, and a feed tube supported by said roller frame and extending axially through the interior of said die spaced from said inner cylindrical die surface, said feed tube having an open inlet end situated with a minimum clearance directly opposite said discharge end of the associated conveying means, means closing said feed tube at its end opposite of said inlet end, said feed tube further having an opening in its side wall, said side opening having an axial length corresponding to and coinciding with the axial length of said associated extrusion roller and said side opening having a circumferential width gradually increasing inwardly towards said closed feed tube end whereby the material supplied to the feed tube by said conveying means and discharged through said side opening is substantially evenly distributed over the axial length of said associated extrusion roller and over the corresponding effective width of said annular die.

3,932,092
APPARATUS FOR MAKING PLASTICS MESH STRUCTURES AND OTHER FORMS OF OPENWORK

Jean-Claude Hureau, Maurepas; Benjamin Rota, Noisy Le Sec, and Philippe Thomas-Castelnau, Paris, all of France, assignors to Generale Alimentaire, Neuilly-sur-Seine, France

Division of Ser. No. 304,818, Nov. 8, 1972, Pat. No. 3,874,969.
This application Aug. 21, 1974, Ser. No. 499,205
Claims priority, application France, Nov. 10, 1971, 71.40270; Dec. 15, 1971, 71.45140
Int. Cl.² B29F *3/04*
U.S. Cl. 425—382 **10 Claims**



1. An apparatus for making plastics mesh structures and other forms of extruded plastics openwork, characterized in that it comprises an extrusion head adapted to be fed with plastics from an appropriate source such as an extruder, the head comprising:

a. means, including a filament extruding die member having a row of continuously open extrusion orifices distributed in one plane in spaced apart relation, for extruding a plurality of continuous filaments parallel to the direction of extrusion and transversely spaced apart;

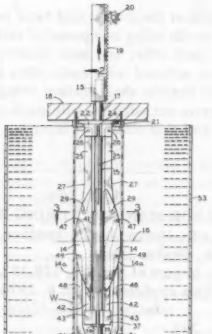
b. a strand extruding die member having a row of spaced apart extrusion slits distributed in a plane different from the plane of the extrusion orifices, each extrusion slit being in length at least as great as the spacing between two adjacent extrusion orifices but less than the entire extent across all of the extrusion orifices; and

c. means, including a blade associated with the strand extruding die member and mounted for reciprocation relative to the extrusion slits therein between a first position at which the slits are open and a second position at which the slits are closed, for separately extruding, periodically and transversely of the continuous filaments, strands that are discontinuous in a transverse direction and extend across less than all of the plurality of continuous filaments, and for urging the extruded strands into engagement with the extruded continuous filaments.

3,932,093
TUBE EXPANDER APPARATUS

Johann H. Maier, 18584 NE. Second Ave., Miami, Fla. 33162

Filed Apr. 25, 1975, Ser. No. 571,640
Int. Cl.² B29C *17/00*; B29D *23/00*
U.S. Cl. 425—392 **10 Claims**



1. In an apparatus for expanding a tubular workpiece, said apparatus having:

an axially displaceable central shaft;

a fixed support having an opening which slidably passes said shaft;

attachment means fixed to said shaft for movement in unison therewith toward and away from said fixed support;

a plurality of expander shoes in succession circumferentially around said shaft;

and linkage arms acting between said fixed support and said expander shoes and between said attachments means and said expander shoes for moving said shoes outward from the shaft upon axial movement of the shaft in one direction and for moving said shoes inward toward the shaft upon axial movement of the shaft in the opposite direction;

the improvement wherein said linkage arms comprise:

a plurality of circumferentially spaced, first, rigid linkage arms, each pivotally connected at its inner end to said fixed support and pivotally connected at its outer end to a corresponding expander shoe at an off-center location on the latter toward said fixed support;

a plurality of circumferentially spaced, second, rigid linkage arms, each pivotally connected at its outer end to a corresponding expander shoe at an off-center location on the latter toward said fixed support but farther from said fixed support than the pivotal connection of the corresponding first linkage arm to said shoe, and each pivotally

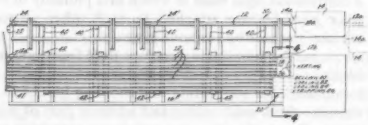
connected at its inner end to said attachment means on the shaft;

and a plurality of circumferentially spaced, third, rigid linkage arms, each pivotally connected at its outer end to a corresponding expander shoe at an off-center location on the latter away from said fixed support, and each extending outside the corresponding second linkage arm and pivotally connected at its inner end to said attachment means at a location on the latter spaced from the pivotal connection thereto of the inner end of the corresponding second linkage arm in a direction away from said fixed support.

3,932,094
MULTIPLE STATION PLASTIC PIPE BELLING MACHINE

Wolfram G. Korff, Granada Hills; Vernon V. Emery, Sun Valley; Joseph Kim Bond, North Hollywood, and Robert S. Hash, Mission Hills, all of Calif., assignors to Emery Company, Inc., Pacoima, Calif.

Filed June 17, 1974, Ser. No. 479,756
Int. Cl.² B29C *17/00*
U.S. Cl. 425—393 **11 Claims**



1. High speed plastic pipe belling apparatus, said apparatus comprising:

A. Endless conveyor means, one end of said conveyor means being disposed to receive lengths of pipe sequentially and transversely deposited on said end of said conveyor and to convey said lengths of pipe periodically a predetermined distance in a first substantially horizontal direction, said conveyor means including:

i. a series of receptacles about said conveyor means, each receptacle serving to receive and retain a pipe at a discrete location on said endless conveyor means as it moves periodically in said first direction;

ii. a positioning plate at one edge of the endless conveyor means;

iii. continuously moving endless belt means, the last said means extending concurrently with, for at least a part of the course of said endless conveyor means, and the upper surface of said endless belt means being in contact with the lowermost portion of each pipe disposed in each of said receptacles, said endless belt means serving continuously to rotate said pipes, the axis of said belt means being slightly canted with respect to the axis of said conveyor means thereby to cause each pipe to be moved vertically transversely to the first direction toward the positioning plate until one end of said pipe abuts said stop plate; said stop plate being so disposed in relation to each length of pipe as to project the opposite end of each said pipe beyond the edge of the conveyor opposite that adjacent the stop plate, for heating and belling;

B. A first drive shaft;

C. First chain and sprocket means, the last said means being engaged to said first drive shaft and adapted to move said endless conveyor means in predetermined increments in said first direction in accordance with the amount of rotation imparted to said first drive shaft;

D. heater means, said heater being disposed along a portion of the opposite edge of the endless conveyor means from that adjacent the stop means, and about the projecting end of each rotating pipe while said pipe is (i) disposed in a receptacle on said endless conveyor means, (ii) being rotated by said endless belt means and (iii) positioned with its distal end abutting said stop plate;

E. multiple station belling means, said belling means extending in said first direction from the end of said heater means; and comprising:

i. a first station including:

a. a pair of clamps having a pair of mating jaws, which jaws in their closed position define a cylindrical opening coaxial with the end of a pipe when it is disposed in said first station after having been moved past said heater means, and said opening being of a diameter equal to the outside diamter of the pipe, said clamps being reciprocable between a first position in which said opening is so defined and said clamps surround the pipe inwardly of the heat-softened end to be belled, and a second position in which said jaws are sufficiently separated from each other to permit a pipe to be moved in said first direction in and out of said first belling station; and

b. means to effect such reciprocation of said jaws at predetermined intervals;

ii. at least one other station adjacent said parallel to said first station, said at least one other station including an air cooling area in which a belled pipe end may be retained for a predetermined cooling period;

iii. air blower means directing cooling air into said area;

iv. a plurality of blocks from each of which extends in said second direction a bevelledended cylindrical plug, each of said blocks being movable:

a. in said first direction at said predetermined increments from said first station to the last of said other stations;

b. from said last station in said first direction a predetermined distance to a position from which the block may be further moved to pass around the other blocks while the latter are disposed to their second and other respective stations;

c. from said position around the other blocks in a fifth direction to another position in alignment with said first station for return movement therewith; and

d. from the last said position, in said fourth direction back into the first station;

v. the said plug in each block, upon the last said movement of the block back into the first station, being inserted in the pipe end then disposed in the said first station and outwardly of said cylindrical opening, to expand said pipe end to conform generally to this configuration of the outer surface of the block plug; and said this inserted plug being retained in the pipe end as its block moves from said first station progressively to the last of said other stations, whereupon, when the block is moved in the first direction, the plug is withdrawn from the pipe end, and the thus-belled pipe may thereafter be discharged from the apparatus by said endless conveyor means; and

F. Synchronized power means, said means, when triggered to commence operation, initiating a cycle which includes:

i. providing at predetermined intervals a predetermined angular rotation of said first drive shaft to move said endless conveyor a predetermined increment in said first direction;

ii. reciprocating the jaws of the pair of clamps to and apart from each other at each such predetermined interval;

iii. moving the block in the said last station in the first direction to its position from which it may be further moved to pass around the other blocks, thereby withdrawing the plug projecting from the said thus-moved block from the end of the pipe in which it has been inserted and retained, so that such pipe, as thus belled, will be discharged by the apparatus upon further incremental movement of the endless conveyor means;

iv. moving each other block in a station preceding said last station to the next station thereby vacating the first

station and disposing a block in each succeeding station including said last station;

v. moving the block in its position from which it may be further moved to pass around the other blocks to its position in alignment with the first station, and, upon vacation of the first station, further in the first direction into the said vacated first station, whereupon the cylindrical plug projecting from the last moved block is forced into the pipe end which has just moved into the said first station by the endless conveyor said predetermined increment from the end of the heater area;

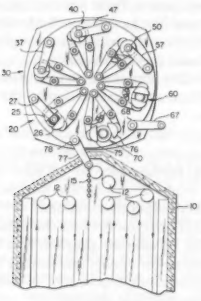
whereby a series of pipe ends may be sequentially and rapidly heated, belled, cooled to set the belled end, and discharged from the apparatus.

3,932,095

BLOW MOLDING APPARATUS

Lawrence A. Moore, Rockford, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 26, 1973, Ser. No. 409,969
Int. Cl.² B29D *23/03*
U.S. Cl. 425—397 **11 Claims**



1. A blow molding apparatus comprising:

an oven, an oven support means within the oven for supporting a plurality of parisons in the oven and moving them through the oven,

a rotating frame positioned adjacent the oven, a plurality of blow molds mounted on said frame to rotate therewith, and

a separate transfer member associated with each of said plurality of blow molds and distinct from its respective blow mold, each transfer member being mounted on the rotating frame to rotate therewith and hence with its respective blow mold, and each transfer member being movable between at least a first position and a second position, the transfer member including means for engaging a parison at said first position while the parison is on said oven support means and removing the parison therefrom and carrying the parison to said second position at which it loads that removed parison into its respective blow mold.

3,932,096

MOLD FOR THERMOFORMING PLASTIC SHEET MATERIAL

Walter Kartman, 1729 Glenridge Circle, West Covina, Calif. 91792

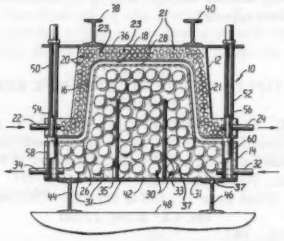
Filed June 10, 1974, Ser. No. 477,688
Int. Cl.² B29C *17/00*
U.S. Cl. 425—398 **9 Claims**

1. A mold for thermoforming plastic sheet material, comprising:

upper and lower matching molding blocks, said molding blocks each comprising:

a shell having an exterior surface and an interior surface defining a closed cavity;

a pourous body of filler material contained within said closed cavity of said shell, said filler material being in surface contact with said interior surface of said closed cavity and comprising a plurality of metallic particles, said pourous body of metallic filler particles comprising



a continuous rigid mass in which said plurality of metallic filler particles are attached to each other at points of surface contact by resinous material;

inlet means for introducing coolant fluid from said molding block;

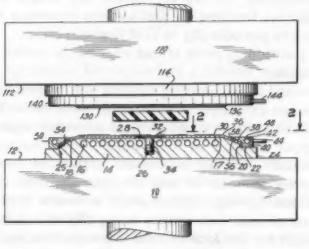
a frame work for supporting said molding blocks at a fixed distance from each other; and wherein part of said exterior surfaces of said upper and lower matching molding blocks define a die cavity.

3,932,097

RECORD MANUFACTURING EQUIPMENT

Lorence Press, 401 E. 86th St., New York, N.Y. 10028

Filed Jan. 30, 1975, Ser. No. 545,490
Int. Cl.² B29D *17/00*
U.S. Cl. 425—407 **5 Claims**

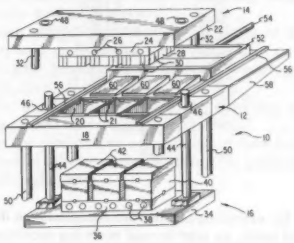


1. Machinery for manufacturing a record comprising a first record press platen, a first record mold secured to said first record press platen, a first stamper having a central portion and a periphery, a second record press platen, a second record mold, said second record mold secured to said second record press platen, a second stamper having a central portion and a periphery, means for securing a first portion of said first stamper to said first record mold, means for securing the periphery of said first stamper to said first record mold and for cooling the outer periphery of plastic that is being formed into a record between said first and second stampers during a stamping operation, means for securing a first portion of said second stamper to said second record mold, and means for securing the periphery of said second stamper to said second record mold and for cooling the outer periphery of plastic that is being formed into a record between said first and second stampers during a stamping operation.

3,932,098
CASE ASSEMBLY WITH TUNGSTEN CARBIDE INSERTS FOR CERAMIC TILE DIE

William W. Huber, North Canton; Rollin R. Shriner, Massillon, and Harry N. Shuman, East Sparta, all of Ohio, assignors to Spartek Inc., Canton, Ohio

Filed Dec. 18, 1974, Ser. No. 534,138
Int. Cl.² B28B 3/02; B29C 3/00; B29B 11/00; B28B 7/00
U.S. Cl. 425—412 20 Claims

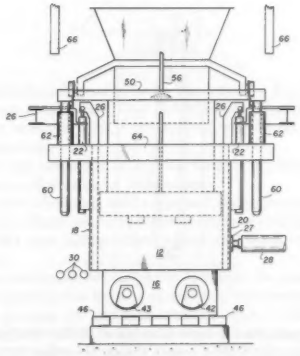


1. A case assembly for defining at least one die cavity for receiving material to be compacted by at least one press member which moves into said die cavity during a pressure cycle and being operative to minimize the tensile stress to which the walls of said die cavity are subjected by said press member comprising a die cavity assembly formed to define the peripheral walls of said die cavity, a substantially rigid frame means surrounding said die cavity assembly, and mounting means to mount said die cavity assembly within said frame means to substantially preclude movement thereof relative to said frame means in the direction of movement of said press member into the die cavity while permitting limited pressure induced movement of said die cavity assembly relative to said frame means in directions normal to the direction of movement of said press member into the die cavity.

3,932,099
MOLD APPARATUS

Norbert Burdy; Christian Ravet, both of Givors, and Jean Lacave, Marseille, all of France, assignors to Fives Lille Cail, Paris, France

Filed Sept. 17, 1973, Ser. No. 398,016
Int. Cl.² B29C 3/00; B30B 11/02
U.S. Cl. 425—432 5 Claims

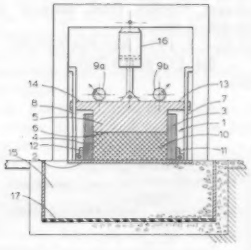


1. A molding apparatus comprising
1. a vibratory mold having an open top,
2. a beam,
3. a cover plate rigidly affixed to the beam and reciprocable through a vertical stroke into and out of the open top of the mold,
4. a frame affixed to the mold, and
5. cooperating guide means on the mold and the cover plate, the guide means being arranged to guide the cover plate during the vertical stroke just before it enters into the mold and to prevent any but vertical movements between the mold and the cover plate when the cover plate is within the mold, the guide means comprising
   a. vertical guide rods carried by the beam and having an operative length less than the length of the vertical stroke of the cover plate, and
   b. vertical bushings cooperating with the guide rods, the vertical bushings being mounted on the frame and the length of the bushings being such that the guide rods enter into the bushings just before the cover plate enters into the mold.

3,932,100
VIBRATORY DEVICE

Rolf Blindheim, Oslo, Norway, assignor to A/S Ardal og Sunndal Verk, Oslo, Norway

Filed Feb. 20, 1975, Ser. No. 551,507
Claims priority, application Norway, Feb. 20, 1974, 564/74
Int. Cl.² B30B 11/02; B28B 3/04
U.S. Cl. 425—432 6 Claims

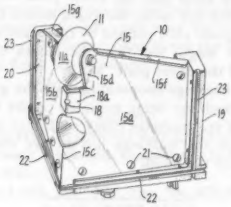


1. A device for molding green blocks or electrodes for the manufacture of anode and cathode carbons for smelting industries, particularly for the electrolytic smelting of aluminum, said device comprising:
a mold including a stationary, plane, horizontal base, and vertical walls firmly fixed to said base and extending upwardly therefrom, thereby providing a chamber for the receipt of paste to be formed into a block, at least one of said vertical walls being removable from said base to facilitate the discharge of a finished block from said mold;
a pressure weight slidably mounted for vertical movement into said chamber, said weight having a lower downwardly facing surface of a configuration to cover substantially the entire horizontal cross-sectional area of said chamber; and
vibration generator means mounted only on said weight for imparting thereto vibratory motion for compacting paste positioned in said chamber.

3,932,101
CORNER FINISHING TOOL

Eugene R. Johnson, Burlingame, and Morris F. Mower, Santa Clara, both of Calif., assignors to Bliss & Laughlin Industries, Inc., Oak Brook, Ill.

Filed Sept. 9, 1974, Ser. No. 504,253
Int. Cl.² B28B 7/08; B05C 17/10
U.S. Cl. 425—458 9 Claims

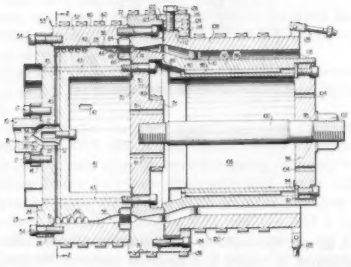


1. A corner finishing tool for applying mastic material along a wall joint comprising container means defining a cavity that is open in two convergent and substantially perpendicular planes and having surfaces in each of said planes that converge peripherally of said cavity for doctoring mastic material that flows thereunder; and a wheel having substantially conical side surfaces that converge to a center rim, said wheel being rotatably mounted from said container means to contact the walls of a wall joint with the conical side surfaces and position the cavity relative thereto.

3,932,102
SPIRAL DESIGN PIPEHEAD

Larry A. Rosenbaum, Marion, Ohio, assignor to Koehring Company, Milwaukee, Wis.

Filed Nov. 1, 1974, Ser. No. 520,357
Int. Cl.² B29D 23/00
U.S. Cl. 425—466 13 Claims



1. In an extruder pipehead for extruding thick-walled plastic pipe, said pipehead being of a type which includes a central inlet bore, a plurality of generally radial ports communicating with said bore, a plurality of helical channels communicating with said ports, a generally annular channel communicating with said helical channels and terminating in a die opening, the improvement comprising:

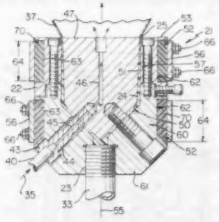
breaker means for splitting the flow of plasticized material into a multiplicity of filaments being positioned across said annular channel downstream of said helical channels; and

restricting means for creating a region of high shear stress on the filaments being provided downstream of said breaker means.

3,932,103
DIE FOR EXTRUDING PLASTIC FILM

Richard M. Rice, Afton, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jan. 31, 1974, Ser. No. 438,185
Int. Cl.² B29F 3/08
U.S. Cl. 425—467 10 Claims

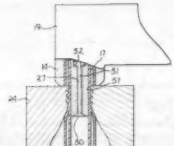


1. A die for extruding plastic film comprising, a die body, an inlet in said body, an inlet in said body for receiving a plastic melt under pressure, an annulus in said die in flow communication with said inlet and having a discharge orifice for extruding said plastic melt therefrom in tubular form, a heat conductive band having an inner portion and an outer portion with said inner portion thereof being supported against said body, said band being made solely of an elongated material wound in a plurality of closely wound adjoining turns which provide a plurality of interfaces between turns thereby assuring said band has a circumferential heat conductivity which is better than its radial heat conductivity, and a heater for heating said band, said heater being supported against said outer portion of said band and said band assuring heat is transmitted so that practically all points of an annular portion of said die body located adjacent said band are substantially at the same temperature.

3,932,104
BLOW FORMING APPARATUS FOR PRODUCING DOUBLE-WALLED VESSELS

Robert F. Schneider, 2326 Sawtelle Blvd., Los Angeles, Calif. 90064

Filed Apr. 29, 1974, Ser. No. 464,811
Int. Cl.² B29D 23/03
U.S. Cl. 425—503 1 Claim



1. An apparatus for blow forming of hollow bodies so as to produce a double-walled vessel, the combination comprising:

a mold including a pair of mated halves having an open cavity defined by the shape of opposing internal wall surfaces;

sleeve means disposed over said open cavity for separating supplied parison within said mold cavity into coaxial inner and outer tubes;

means forming a portion of said mold at its extreme opposite ends for joining the opposite ends of said coaxial inner and outer tubes to seal said circular space between said inner and outer tubes so as to constitute the double walls of said vessel;

an extrusion die for extruding the parison into said cavity;

said sleeve comprising a part of said die whereby parison is divided into a pair of downwardly depending coaxial tubes into said mold cavity;

said joining means comprises cut-off portions at opposite ends of said mold cavity for severing said parisons and engaging the terminating ends of said tubes together in an integral joint;

means for trapping air between the opposing surfaces of said inner and outer tubes comprising;

air means for introducing pressurized air into the center of said coaxial tubular parisons urging the parisons into the form of said cavity.

3,932,105

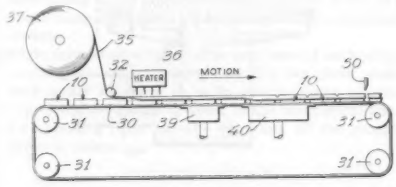
APPARATUS FOR LINING CARTONS

Lawrence H. Knoell, St. Paul, Minn., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Division of Ser. No. 506,945, Sept. 18, 1974. This application May 30, 1975, Ser. No. 582,291

Int. Cl.² B29C *17/04;* **B29D** *3/02*

U.S. Cl. 425—504 **5 Claims**



1. Apparatus adapted to line a tray having a flat bottom and upright side walls made from foldable paperboard or similar sheet-like material with a continuous strip of thermo-plastic film, comprising:

continuous conveyor means for holding a plurality of said trays in close spaced relationship;

means for advancing said trays and said conveyor;

means for dispensing a continuous strip of said thermo-plastic film into juxtaposition above said trays on said conveyor;

means positioned beneath said conveyor for pulling a vacuum through the bottom of said tray which can pull down that portion of said film directly above said tray into contiguous conforming relationship with the inside surfaces of said tray; and

means for separating said tray and contiguous conforming portion of said film from that film positioned between adjacent trays and not in contact therewith.

3,932,106

INJECTION MOLDING HEAD FOR FORMING HONEYCOMBED THERMOPLASTIC STRUCTURES

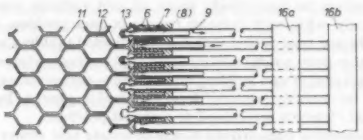
Arnold Vogts, Krahenwinkel, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshuette Aktiengesellschaft, Germany

Filed July 11, 1974, Ser. No. 487,537

Claims priority, application Germany, July 17, 1973, 2336313

Int. Cl.² B29C *23/00*

U.S. Cl. 425—505 **6 Claims**



1. Injection molding head for forming honeycombed structures of thermoplastic materials, comprising:

a fixed mouthpiece having a plurality of apertures extending longitudinally therethrough for providing extrusion orifices each having a permanent cross-sectional configuration in an output surface of said mouthpiece, and a plurality of guide channels extending longitudinally therethrough and interposed between but spacially separated from said apertures;

strand deviation guide means including:

a plurality of elongated members each slidably mounted in one of said guide channels;

a frame means attached to one end of each of a group of said elongated members for moving in a longitudinal direction one end of each of said elongated members beyond the exit end of said fixed mouthpiece for the provision of high thrust, lateral forces only beyond said output surface but proximate to the output of said extrusion orifices, and withdrawing said ends of the said elongated members from said extended position to within said fixed mouthpiece; and

drive means coupled to said frame means for moving said frame means toward and away from said fixed mouthpiece in an oscillatory manner.

3,932,107

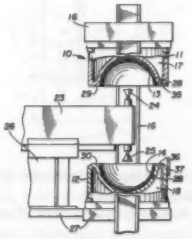
APPARATUS FOR FORMING COMPOSITE ARTICLES

James R. Proudfit, Youngwood, Pa., assignor to The General Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 469,987, May 15, 1974, abandoned. This application Jan. 9, 1975, Ser. No. 539,674

Int. Cl.² B29C *5/00;* **B29F** *5/00;* **B29C** *17/00*

U.S. Cl. 425—509 **22 Claims**



1. Apparatus for forming an inflatable composite article including an inflatable center covered with a molded material formed under heat and pressure, said center being adapted to

retain said article in a predetermined shape after being formed, comprising:

A. molding means including interconnected complementary metal elements movable between an open position and a closed position, said elements having surfaces which define, when said elements are in closed position, a molding cavity substantially corresponding to the desired shape and surface finish of said composite article, said metal elements including means to open and close said molding means;

B. electrostatic pressure spraying means movably inserted into said molding means when said elements are in open position to respectively spray all said surfaces concurrently, while said elements remain in open position, for a selected time period with a finely divided molding material to form a substantially dried uniform layer of selected thickness of said molding material onto said surfaces, and to be movably retracted from said molding means before said elements are moved to a closed position;

C. adjustable pressurizing means to inflate said center to a selected pressure, as said center is disposed within said molding cavity after said elements have been moved to a closed position, and thereby to compress said molding material into forceful contact with said center and with said surfaces to produce details in said molding material conforming to said surfaces;

D. heating means to heat said molding means for a selected time and at a selected temperature while said center is maintained by said pressurizing means at said selected pressure until said molding material [2] finally formed into a finished covering to complete said composite article; and

E. cooling means to cool said molding means before said elements are moved to open position for removal of said composite article from said molding means.

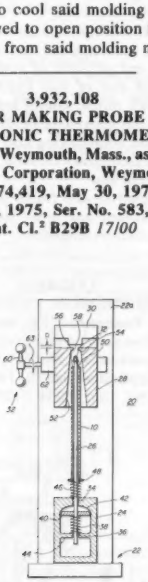
3,932,108
APPARATUS FOR MAKING PROBE COVERS FOR ELECTRONIC THERMOMETERS

Robert Bruce Turner, Weymouth, Mass., assignor to American Medical Electronics Corporation, Weymouth, Mass.

Division of Ser. No. 474,419, May 30, 1974. This application June 3, 1975, Ser. No. 583,443

Int. Cl.[2] B29B *17/00*

U.S. Cl. 425—515 **4 Claims**



1. Apparatus for forming an electronic thermometer probe from a piece of tube comprising:

a stop member having a first surface abutting a first end of said tube;

a die member having a hole and a second surface for receiving the second end of said tube;

a first pin member for receiving said tube and extending from said first surface of said stop member, through the first surface, said hole, and the second surface, successively, of said die member and beyond said second surface;

said second surface of said die member and said first surface of said stop member being spaced apart a distance; and

a heater means for heating said second end of said tube extending beyond said second surface to cause said second end to turn outwardly from said first pin member and downwardly toward said second surface to flatten and form a flange.

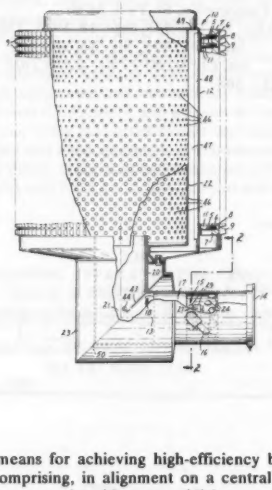
3,932,109
ULTRASONIC BURNER MEANS

Edwin W. Pitcher, White Bear Lake, and Thomas L. Nystrom, Falcon Heights, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 334,749, Feb. 22, 1973, Pat. No. 3,808,056. This application Mar. 11, 1974, Ser. No. 449,928. The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.

Int. Cl.[2] F23C *3/02;* **B05B** *3/14*

U.S. Cl. 431—1 **8 Claims**

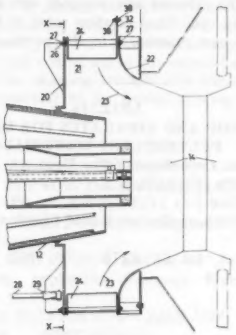


1. Burner means for achieving high-efficiency burning of liquid fuels comprising, in alignment on a central axis, (A) blower means arranged to blow an oxidizing gas along said axis; (B) an ultrasonic atomizer downstream from the blower means, connected to a source of liquid fuel, and having a vibrating horn located on said axis from which the fuel emanates downstream as a fine mist, (C) a cylindrical wall spaced radially around said horn and in line with said blower means so as to convey said oxidizing gas downstream from said blower means past said horn; and (D) baffle means disposed around said horn and consisting essentially of a set of overlapping vanes that are attached to the inside of said wall, extend radially toward said axis, and are disposed at an angle to said axis so as to form a first part of the oxidizing gas that is conveyed downstream by the cylindrical wall into a vortex; the innermost edge of the vanes being adjacent to, but spaced from, said horn so as to define an area through which a second part of said oxidizing gas passes unimpeded; and at least part of the outermost edge of the vanes being spaced from the cylindrical wall so as to permit a third part of said oxidizing gas to pass unimpeded along the wall so as to contain said vortex into a compact area, whereby the flame of fuel supplied by said ultrasonic atomizer is kept compact.

3,932,110
INTERVANE BURNERS

Alistair Tobias Waddell, Larbert, Scotland, assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Sept. 12, 1974, Ser. No. 505,283
Int. Cl.² F23M 9/00
U.S. Cl. 431—184 5 Claims



1. An apparatus for controlling the flow of gas entering an annular duct wherein a plurality of vanes are rotatably mounted between front and rear walls of the duct about an axis parallel to the axis of the annular duct to control the amount of gas entering the duct when actuated, each vane being angularly evenly spaced around the periphery of a circle whose axis is coincident with the axis of the annular duct and arranged to cause the gas which passes over them to follow a swirling path in the duct, the improvement comprising:

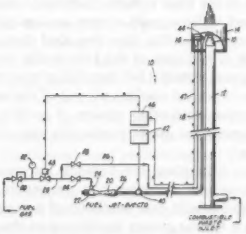
an arrangement of the vanes into three groups of vanes, means for mechanically interconnecting the vanes of each group to one another so that actuation of one of said vanes causes the vanes of the group to open and close in unison;

a single drive shaft connected to one vane of each group, a mechanical linkage means coupling the drive shaft of each group of vanes so as to operate same in unison, common drive means coupled to the mechanical linkage for actuating same thereby operating all the groups of vanes in unison.

3,932,111
APPARATUS FOR INCINERATING COMBUSTIBLE WASTES

Alvin C. Liknes, and Lyle C. Knight, both of Edmonton, Canada, assignors to Black, Sivalls & Bryson, Inc., Houston, Tex.

Filed Oct. 29, 1974, Ser. No. 518,280
Int. Cl.² F23D 13/20
U.S. Cl. 431—202 12 Claims



1. Apparatus for incinerating combustible wastes comprising:

a flare stack connected to the source of said combustible wastes;

a pilot flame burner attached to said flare stack and positioned with respect thereto so that combustible wastes discharged therefrom are ignited by said pilot flame;

a first conduit attached to said pilot flame burner for continuously conducting fuel and air to said burner;

a fuel jet-ejector for producing a continuous stream of a combustible mixture of fuel and air having a fuel inlet connection, an air inlet connection and a fuel-air mixture discharge connection, said discharge connection being connected to said first conduit;

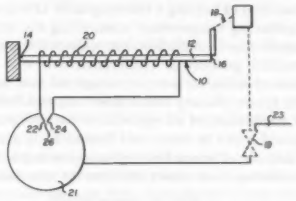
a second conduit connecting the fuel inlet connection of said fuel jet-ejector to a source of fuel; and

a third conduit connected to said second conduit and to said pilot flame burner for conducting a continuous stream of fuel to said burner separately from the fuel-air mixture conducted thereto by said first conduit.

3,932,112
MAGNETOELASTIC, REMANENT, HYSTERETIC DEVICES

Ivan J. Garshelis, 61 Oleander Way, Clark, N.J. 07066

Filed July 12, 1974, Ser. No. 488,208
Int. Cl.² F23Q 3/00
U.S. Cl. 431—255 14 Claims



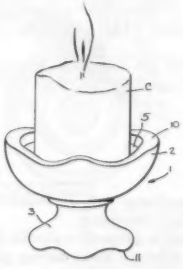
1. An electromechanical element, comprising:

a circularly magnetized, magnetostrictive rod that exhibits hysteresis in its magnetic induction vs. twist strain curve.

3,932,113
CANDLE HOLDER UNIT AND THE LIKE

James Lloyd Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Feb. 19, 1974, Ser. No. 443,365
Int. Cl.² F23D 3/16
U.S. Cl. 431—297 4 Claims

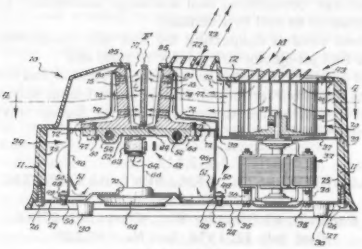


1. A bowl shaped unit comprising a bowl portion and an annular foot portion, said portions each having socket means for receiving an article and a corrugated edge, the edges of each of said portions comprising a corrugated surface which is adapted to mesh with a corrugated edge of a similar unit to permit the units to stack relative to each other and to prevent movement of the units relative to each other, said bowl portion having an interior ledge and said foot portion being of a size so as it may seat on the ledge of a similar unit.

3,932,114
DEVICE FOR HEATING THERMOPLASTIC EYEGLASS FRAMES

Edward A. Ebert, 203 Huxley Drive, Snyder, N.Y. 14226

Division of Ser. No. 207,086, Dec. 13, 1971, Pat. No. 3,816,705. This application June 3, 1974, Ser. No. 475,431
Int. Cl.² F27D 7/00
U.S. Cl. 432—5 4 Claims

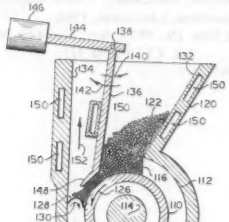


1. A method of heating a thermoplastic article to a predetermined softening temperature comprising the steps of providing opposed rays of radiation into a space having a sufficiently unobstructed portion in communication with the ambient environment so as to permit passage of said article directly into said space; placing said article into and holding it in said space for radiation of its opposite sides; and pumping heated air into said space to cause said heated air to pass around said article and out of space through said unobstructed portion to prevent entrance of cooler ambient air into said space.

3,932,115
VENTED HOPPER WITH IMPROVED FEED SYSTEM

Bryce Maxwell, 19 McCosh Circle, Princeton, N.J. 08540

Filed Oct. 31, 1974, Ser. No. 519,455
Int. Cl.² F27D 5/00
U.S. Cl. 432—5 14 Claims



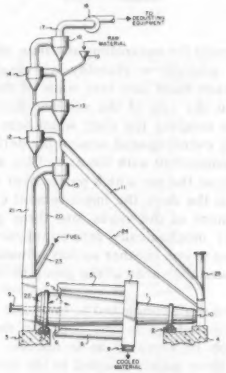
1. A hopper apparatus with an improved feed system for polymer processing comprising:
   a. a casing having a generally cylindrical inner surface;
   b. a rotatably mounted rotor having generally cylindrical surface concentric with said inner surface of said casing and spaced inward therefrom to define an annular region therebetween;
   c. a hopper having a downwardly facing discharge opening communicating with said annular region; and
   d. a control means movably attached to said casing and positioned extending into said annular region adjacent said rotor for varying the effective area of said discharge opening, said control means being actuated by material located in said annular region.

11. A method for feeding polymeric material into processing and mixing equipment which comprises:
   a. introducing new polymeric material into a hopper;
   b. controlling the amount of new material released into the hot melt material in response to the amount of hot melt material;
   c. heating the melting material while in an annular region about a rotor; and
   d. urging the released new material into contact with an essentially cylindrical rotating rotor to facilitate movement of new material into the previously melted hot material.

3,932,116
METHOD AND APPARATUS FOR BURNING PULVERULENT MATERIALS

Dan S. Hansen, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed July 24, 1974, Ser. No. 491,603
Claims priority, application United Kingdom, July 31, 1973, 36377/73
Int. Cl.² F27B 15/00, 7/02
U.S. Cl. 432—14 15 Claims



1. A method of burning pulverous or granular material in a plant including a suspension preheater and a rotary kiln having a burner means positioned at one end portion and having an integrally mounted planetary cooler having a series of cooler tubes for cooling the burnt material exiting from the kiln by means of air subsequently used for combustion and preheating in the plant, comprising directing the heated cooling air from the planetary cooler tubes into the rotary kiln, dividing said cooling air into two streams, at a location adjacent the burner end portion of the kiln, directing the divided cooling air out of both ends of the kiln in its divided streams, directing at least one stream of the heated cooling air comprising a portion of the total volume of heated cooling air into the rotary kiln and utilizing said stream as combustion air in the rotary kiln and thereafter directing said stream as part of a waste gas out of one end of the kiln to the preheater for use in preheating raw material fed into said preheater, drawing the other stream of heated cooling air out of the other end of the kiln and directing said other stream of cooling air to the suspension preheater for use in preheating raw material fed into said preheater.

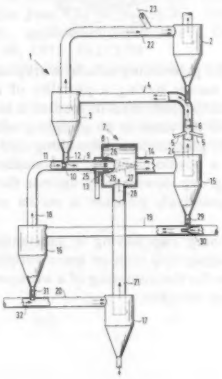
5. A rotary kiln plant for burning pulverous or granular material comprising a suspension preheater, a rotary kiln having a material inlet end portion and a material outlet end portion with a burner means positioned at the material outlet end portion and having an integral rotary cooler, the cooler including a plurality of cooler tubes mounted in planetary fashion about the kiln, means to direct the cooling air passing

through the planetary cooler tubes into the kiln at a location adjacent the burner end portion so as to divide the cooling air into two streams directed to both end portions of the kiln, at least one duct means at each end portion of the rotary kiln communicating with the suspension preheater, one duct means directing the waste gas from the combustion or burning in the kiln from the waste gas outlet end portion of the kiln to the preheater, the other duct means directing part of the cooling air heated by passage through the cooler tubes to the preheater for preheating raw material, and a material discharge pipe extending from the material discharge end portion of the preheater and connected to the material inlet end portion of the kiln for charging the kiln with the material preheated in the preheater by the heated cooling air and kiln waste gas.

3,932,117
METHOD OF BURNING OR SINTERING FINE-GRAIN MATERIAL

Horst Ritzmann, Enniger, Germany, assignor to Polysius AG, Neubeckum, Germany

Filed Sept. 19, 1974, Ser. No. 507,410
Claims priority, application Germany, Oct. 10, 1973, 2350768
Int. Cl.² F27B *15/00*; F26B *3/08*
U.S. Cl. 432—14 **8 Claims**

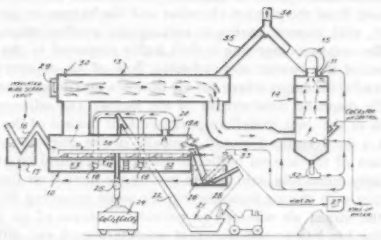


1. In a method of burning or sintering fine-grained material, such as cement raw meal, lime, dolomite, magnesite or hydrate of alumina, which agglomerates above a critical temperature wherein a gas-carried flow of material is passed successively through a preheating zone, a final heating zone wherein the material is heated to a final treatment temperature higher than said critical temperature by passing a flame, and a separation-cooling zone wherein the material is separated from the hot exhaust gases of said final heating zone and the separated hot exhaust gases are conducted to said preheating zone to preheat material therein; the improvement comprising the steps of introducing material into an elevated portion of said preheating zone to cause said introduced material to fall downwardly through said zone, and introducing the exhaust gases from said final heating zone into a lower portion of said preheating zone in an upwardly directed stream establishing an upwardly directed flow operable to carry the introduced material upwardly through said preheating zone to an elevated discharge opening, the path of said material through said preheating zone including a downwardly directed section and an upwardly directed section and supplementing the preheating of said material by said exhaust gases by adding heat to said preheating zone at a location traversed by both the upward and downward sections of said path to supply enough additional heat to said preheating zone to heat the material therein to a temperature less than said critical temperature but high enough to enable the material to be heated to said final temperature during transmit of said final heating zone.

3,932,118
INSULATION REMOVAL APPARATUS

Frank W. Eggers, III, Hermann, Mo.; Ralph O. Wigger, Yonkers, N.Y., and Richard L. Coan, Clayton, Mo., assignors to Cerro Corporation, New York, N.Y.

Filed Jan. 2, 1974, Ser. No. 429,967
Int. Cl.² F27B *15/00*, *9/18*
U.S. Cl. 432—58 **7 Claims**



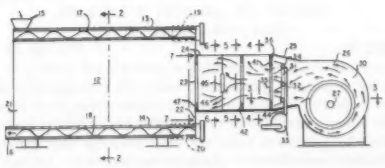
1. A device for treating material with fluidized particles comprising:

1. a chamber provided with means for fluidizing particles.
2. means for heating said particles,
3. a bed in said chamber on which the material to be treated resides during treatment,
4. means for depositing material to be treated on said bed,
5. reciprocating means for moving said material being treated lineally on said bed, said means comprising first and and second members, said first member being movable in unison with and independently of the second member, said first member including means for engaging material to be treated and moving said material longitudinally along said bed, and means for disengaging said first member from said material to be treated by raising said engaging means above said bed, and
6. means for removing material after treatment from said chamber.

3,932,119
BAFFLES FOR GRAIN DRYER

Erhard E. Alms, Barrington, and James E. Mitchell, Algonquin, both of Ill., assignors to AFE Industries, Inc., Lake Zurich, Ill.

Filed June 20, 1974, Ser. No. 481,153
Int. Cl.² F27D *1/00*; F24H *1/00*
U.S. Cl. 432—101 **7 Claims**



1. In combination, a grain drying bin comprising a pair of oppositely curved columnar bins having a common feed opening at the top and a common discharge opening at the bottom thereof and defining the sides, top and bottom of a plenum

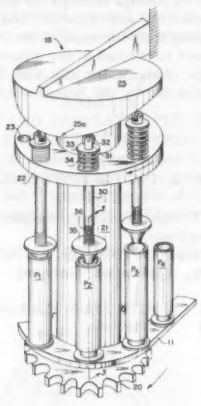
chamber, a wall closing one end of the plenum chamber, a burner, a blower adjacent the burner and having a discharge opening communicating with the burner, and a duct surrounding the burner and connecting the burner outlet with the plenum chamber at the end thereof opposite the said wall, said blower providing air in the duct at different velocities over the cross section of the duct and at an average velocity producing a temperature differential lengthwise of the plenum chamber, baffle means in the duct selectively deflecting the air in the duct to create a predetermined pattern of temperature variation over the cross section of the duct whereby to produce a predetermined and different temperature differential in the plenum chamber from the front wall to the rear wall thereof, wherein said blower is disposed on the side of the burner remote from the plenum chamber and discharges air into said duct, said burner having a rectangular configuration, said baffle means comprising a first baffle disposed in the duct adjacent the burner and reducing flow of air adjacent said burner at locations where the air flow is a maximum, a second baffle disposed downstream of the burner and adjacent the walls of the duct to deflect peripheral air inward of the duct, and a third baffle disposed centrally of the duct and downstream of the second baffle to deflect the central air stream radially outwardly, said baffles mixing the heated air from the burner with the air from the blower while retarding the flow of the mixed air whereby to provide a stream of air to the drying bin having the aforesaid predetermined and different temperature differential in the plenum chamber, wherein said blower is a centrifugal blower having a rectangular outlet, said duct is rectangular and connected to the rectangular outlet of the blower, said centrifugal blower having opposed inlet openings through which air is drawn by the blower in directions transverse to the general axis of the duct, said air, upon passing through the blower entering the duct with a maximum velocity at the outer central region of the rectangular outlet, and said first baffle reducing flow of air at said outer central region, and said first baffle comprising a substantially flat sheet extending across said duct and having a rectangular opening therein conforming in size, orientation and configuration to the size, orientation and rectangular configuration of the burner except for the outer central region of the duct corresponding to the outer central region of the rectangular blower outlet at which point the baffle extends inward to block a portion of the flow from said burner.

3,932,120

DEVICE FOR POSITIVE POSITIONING OF TUBULAR WORKPIECES

Nickolas N. Sokolow, Roscoe, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed May 17, 1974, Ser. No. 471,147
Int. Cl.[2] F27B 9/00
U.S. Cl. 432—121 **19 Claims**



1. A device for positioning tubular workpieces comprising:
a conveyor means having a plurality of carrier members thereon, each positioned to receive a tubular workpiece and to hold the same in an upright position,
and a positive placement station along said conveyor means including a positioning cap, and means for moving the positioning cap downwardly against the top of a workpiece to positively position it on its respective carrier member,
said positioning cap having a substantially symmetrical portion engageable with an inner peripheral portion of a workpiece for the centering of a workpiece on its respective carrier member.

3,932,121

PROCESS FOR THE DYEING OF MODIFIED POLYESTER FIBERS

Kazuo Kawakami; Hiroshi Imagome; Sumio Ishizaki, and Genpei Sugiyama, all of Tokyo, Japan, assignors to Hodogaya Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Oct. 5, 1973, Ser. No. 403,977

Claims priority, application Japan, Oct. 12, 1972, 47-101556

Int. Cl.² D06P *3/82*

U.S. Cl. 8—21 C 4 Claims

1. A process for dyeing modified polyester fibers containing sulphonate groups, either alone or in the form of mixed fibers or fabrics containing them, with a cationic dyestuff selected from the group consisting of methines, azomethines, diphenylmethanes, triphenylmethanes, oxazines, thiazines, xanthenes, heterocyclic azos, anthraquinone series dyestuffs and non-conjugated type arylazo dyestuffs having an external onium group, wherein the dyeing is performed in the presence of one or more aliphatic dicarboxylic acid dialkylesters or diallylesters containing from 8 to 14 carbon atoms.

3,932,122

AZO COMPOUNDS, THEIR MANUFACTURE AND USE

Visvanathan Ramanathan, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

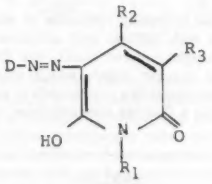
Division of Ser. No. 190,678, Oct. 19, 1971, abandoned. This application June 12, 1973, Ser. No. 369,359

Claims priority, application Switzerland, Oct. 23, 1970, 15658/70; Sept. 30, 1971, 14211/71

Int. Cl.² C09B *29/36;* D06P *3/56*

U.S. Cl. 8—41 C 6 Claims

1. A process for coloring synthetic polyester textile materials which comprises applying to said materials, by a dyeing, padding or printing process, an aqueous dispersion of an azo compound of the formula



wherein

D represents the radical of a diazo component,

R_1 and R_3 each represent a hydrogen atom or a substituent and

R_2 represents a substituent, said compound containing at least one carboxy group, that may not, however, be bonded in the adjacent position to the azo bridge directly to the ring.

3,932,123

FLAMEPROOFING OF COTTON CELLULOSE WITH HEXAMETHYL PHOSPHOROUS TRIAMIDE

Leon H. Chance, New Orleans, and Armand B. Pepperman, Jr., Metairie, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 16, 1973, Ser. No. 342,136

Int. Cl.² D06M *1/00, 13/34;* B27K *3/00;* C09K *3/00*

U.S. Cl. 8—116 P 7 Claims

1. A process for producing a flame resistant and cation exchangeable cellulosic material which process comprises crosslinking a cellulosic material by reacting said material with hexamethylphosphorus triamide and allowing the phosphorus ester crosslinking of said material to take place at a temperature ranging from room temperature to about 120°C. for a period of about 5 minutes to 90 minutes.

3,932,124

PROCESS FOR SETTING TEXTILES

William L. Wasley, Pacific Grove, and Allen G. Pittman, El Cerrito, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 436,264, Jan. 24, 1974. This application Sept. 9, 1974, Ser. No. 504,643

Int. Cl.² D06M *3/02*

U.S. Cl. 8—127.5 12 Claims

1. A method for imparting a stable set to a proteinous textile, which consists of -

a. arranging the textile in a predetermined pattern,

b. while constraining it in such pattern immersing the textile in a bath consisting of ethylene glycol at a temperature in the range 120 to 180° C. and for a time governed by the limits of the equation

$$T = 175 \pm 10 - 16.7 \log t$$

wherein T is the temperature in degrees Centigrade, and t is the time in seconds,

c. while still constraining the textile in the predetermined pattern immediately arresting the treatment by cooling the textile,

d. washing the textile to remove residual ethylene glycol, and drying the textile.

3,932,125

PREPARATION OF STRETCHABLE WOOL TEXTILES

William L. Wasley, Berkeley, and Allen G. Pittman, El Cerrito, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 24, 1974, Ser. No. 436,264

Int. Cl.² D06M *3/02*

U.S. Cl. 8—128 R 14 Claims

1. A process for enhancing the stretchability of a wool-containing textile, which consists of

a. immersing the textile in a bath consisting of ethylene glycol at a temperature in the range 120° and 180° C. and for a time governed by the limits of the equation

$$T = 175 \pm 10 - 16.7 \log t$$

wherein T is the temperature in degrees Centigrade, and t is the time in seconds,

b. immediately arresting the treatment by cooling the textile,

c. washing the textile to remove residual ethylene glycol, and drying the textile.

3,932,126

DYEING ASSISTANT COMPOSITION CONTAINING ORGANIC AMINES AND CARBOXYLIC ACIDS FOR COLORING POLYESTER MATERIAL WITH ACID DYES

Dara Ardeshir Jilla, Collinsville, Va., assignor to Martin Processing Co., Inc., Martinsville, Va.

Filed Oct. 5, 1973, Ser. No. 403,850

Int. Cl.² D06P *1/645, 1/653*

U.S. Cl. 8—172 10 Claims

1. A process for coloring a polyester material, which comprises impregnating the same by padding, printing or cascading with an aqueous solution or printing paste of one or more acid dyes in admixture with both (a) a separate organic nitrogen compound selected from the class consisting of diethylenetriamine, triethylenetetramine, tetraethylenepentamine, hexamethylenediamine, hexamethylenetetramine, and mono-, di- and tri-ethanolamines, and (b) a separate organic carboxylic acid, drying the impregnated polyester material and then exposing same to dry heat at a temperature between 150°C. and 250°C. for a period of 5 to 60 seconds, thereby effecting

fixation of said acid dye or dyes on the polyester material and substantially uniform distribution thereof within the polyester material.

3,932,127

DYEING TEXTILE MATERIALS OF A BASIC CHARACTER

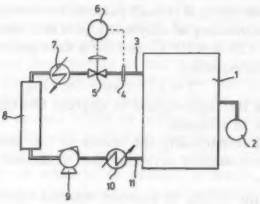
Jean Marie Louis Jules D'Albignac, Creil, France, assignor to Groupement d'Interet Economique Stx, Paris, France

Filed Jan. 26, 1973, Ser. No. 326,909

Claims priority, application France, Jan. 26, 1972, 72.02512

Int. Cl.² D06P *5/04*

U.S. Cl. 8—173 **10 Claims**



1. A process for dyeing, by exhaustion, textile fibres of basic character with anionic dyestuffs in an organic solvent medium wherein the dyebath is a homogeneous ionizing liquid medium and the cations of the bath are replaced by H^+ protons by a cation exchange resin in the course of the dyeing, the dyeing being effected at a temperature equal to or less than 80°C.

9. In a process for the dyeing, by exhaustion, of textile fibres of basic character with anionic dyestuffs in an organic solvent medium, the improvement comprises using a homogeneous ionizing liquid medium as the dyebath and the cations of the bath are replaced by H^+ protons by a cation exchange resin in the course of the dyeing, the dyeing being effected at a temperature equal to or less than 80°C.

10. In a process for the dyeing, by exhaustion, of textile fibres of basic character with anionic dyestuffs in an organic solvent medium, the improvement which comprises using a homogeneous ionizing liquid medium as the dyebath and contacting the dyebath with cation exchange resin to replace the cations in the dyebatch with H^+ protons in the course of dyeing, wherein the dyeing is effected at a temperature of equal to or less than 80°C.

3,932,128

DYE CARRIERS FOR POLYAMIDE FIBERS

Robert J. Beaulieu, Bronx, N.Y., assignor to Millmaster Onyx Corporation, New York, N.Y.

Filed Jan. 29, 1975, Ser. No. 544,891

Int. Cl.² D06P *5/04*

U.S. Cl. 8—173 **16 Claims**

1. A carrier for a dye for polyamide fibers made by the condensation of the monomers 4,4'-diamino-dicyclohexyl methane, or alkylated derivatives thereof, and dodecanoic acid comprising a swelling agent consisting of a mixture of normal-butyl benzoate and an alkyl phenol selected from the group consisting of para-tertiary butyl phenol and para-tertiary amyl phenol, said butyl benzoate and alkyl phenol being present in a ratio to each other of between about 1:2 to about 2:1 by weight.

6. A dyeing composition for polyamide fibers made by the condensation of the monomers 4,4'-diamino-dicyclohexyl methane, or alkylated derivatives thereof, and dodecanoic acid a dye, a carrier for said dye and water, said carrier comprising a swelling agent consisting of a mixture of normal-butyl benzoate and an alkyl phenol selected from the group consisting of para-tertiary butyl phenol and para-tertiary amyl phenol, said butyl benzoate and alkyl phenol being present in a ratio to each other of between about 1:2 to about 2:1 by weight.

11. A method of dyeing polyamide fibers made by the condensation of the monomers 4,4'-diamino-dicyclohexyl methane, or alkylated derivatives thereof, and dodecanoic acid which comprises applying to said fibers a dyeing composition comprising a dye, a carrier for said dye and water, said carrier comprising a swelling agent consisting of a mixture of normal-butyl benzoate and an alkyl phenol selected from the group consisting of para-tertiary butyl phenol and para-tertiary amyl phenol, said butyl benzoate and alkyl phenol being present in a ratio to each other of between about 1:2 to about 2:1 by weight.

3,932,129

SPACE DYED YARN PRODUCTION USING DENSE FOAMS

Rick Anthony Porter, 2826 Dunnington Circle, Atlanta, Ga. 30341

Filed July 17, 1974, Ser. No. 489,265

Int. Cl.² D06P *3/00*

U.S. Cl. 8—176 **2 Claims**

1. The process which comprises forcing different colored foamed dye solutions or foamed dye resist solutions into yarn packages followed by microwave heating to accelerate the diffusion and reaction of the dyes in the fiber.

3,932,130

INHIBITION OF ALUMINUM CORROSION BY SULFURIC ACID SOLUTIONS

Richard H. Bennett, and James W. Brockington, both of Richmond, Va., assignors to Texaco Inc., New York, N.Y.

Filed July 3, 1974, Ser. No. 485,400

Int. Cl.² C23F *11/04*; **C23G** *1/04*

U.S. Cl. 21—2.7 R **4 Claims**

1. A method for inhibiting corrosion of aluminum and its alloys in contact with sulfuric acid solutions comprising at least about 68 weight percent H_2SO_4 and from about 0 to about 20 weight percent water, which method comprises dissolving fluoride containing compounds in said sulfuric acid solution to provide a fluoride concentration of at least about 300 ppm.

3,932,131

METHOD AND DEVICE (ANALYSIS MACHINE) FOR SIMULTANEOUS PERFORMANCE OF A NUMBER OF ANALYSES, ESPECIALLY MICROANALYSES, OF STANDARD TYPE ON CHEMICAL OBJECTS

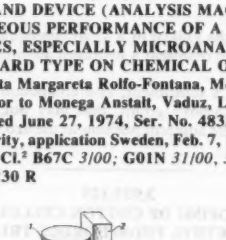
Gudrun Birgitta Margareta Rolfo-Fontana, Monte-Carlo, Monaco, assignor to Monega Anstalt, Vaduz, Liechtenstein

Filed June 27, 1974, Ser. No. 483,621

Claims priority, application Sweden, Feb. 7, 1974, 7401657

Int. Cl.² B67C *3/00*; **G01N** *31/00, 31/18*

U.S. Cl. 23—230 R **14 Claims**



1. A method for the simultaneous performance of a number of analyses, comprising disposing a multiplicity of receptacles

for analysis of treated samples in a fixed relationship in vertical columns and horizontal planes to form a receptacle array in mating interfacial juxtaposition to similarly disposed arrays of operative means comprising reagent dispensing means, sample dispensing means, treatment means, analytic means, and receptacle cleaning means respectively such that individual operative means are coordinately positioned for simultaneous engagement with a multiplicity of receptacles; said receptacle array is periodically progressed laterally in stepwise manner to maintain said juxtaposed relationship in a series of spaced positions; executing steps in the analytic sequence simultaneously with said operative means, respectively upon a multiplicity of selected individual receptacles, in sequence at each of the progressive positions whereby individual receptacles are simultaneously progressed in a series of steps through a cycle of sample treatment and analysis to cleaning.

3,932,132
SYSTEM FOR DETECTING THE PARTICULAR CHEMICAL CONSTITUENT OF A FLUID

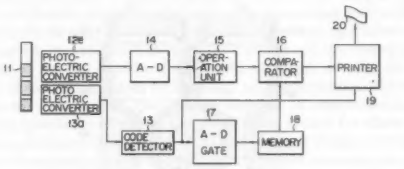
Kazuo Hijikata, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed July 23, 1974, Ser. No. 490,984

Claims priority, application Japan, July 31, 1973, 48-86168; July 31, 1973, 48-86169; July 31, 1973, 48-86171; July 31, 1973, 48-86172

Int. Cl.² G01N *33/16, 21/30*

U.S. Cl. 23—253 R **5 Claims**



1. A system for detecting the particular chemical constituent of a fluid which comprises a chemical reaction-testing piece including a plurality of absorption reagent carriers arranged on a narrow transparent substrate at a prescribed interval, such that the kinds of the respective reagents and the positions of their carriers on the substrate can be indicated by coded signals representing said arrangement and the positions of the exposed transparent portions of the substrate intervening between said reagent carriers; a memory device for storing data corresponding to reference chemical reactions used to determine the sequential positions of the degrees of cheimcal reactions between a test fluid and the reagents contained in the plural absorptive carriers mounted on the chemical reaction-testing piece; a first photoelectric conversion element for successively scanning the exposed transparent portions of the substrate of the chemical reaction-testing piece and the reagent carriers spatially arranged on the substrate to provide a coded signal distinguishing the type of said testing piece; a code detector coupled to said first photoelectric conversion element for obtaining from an output signal from said first photoelectric conversion element the data which distinguishes the type of the testing piece and the positions of the reagent carriers disposed on the substrate of said testing piece; a second photoelectric conversion element for providing electric signals denoting those optical changes occurring in the respective reagent carriers mounted on the substrate of the testing piece which correspond to the degrees of the chemical reactions between a test fluid and the reagents contained in said carriers; an analog-digital converter for converting said electric signals into digital signals denoting the measured degrees of chemical reactions; an arithmetic operation device for providing data on the measured degrees of chemical reactions from digital output signals from said analog-digital converter; a gate circuit for reading out from the memory device the data on the reference chemical reactions which correspond to the measured reagents by using said testing piece type-distinguishing data; a comparator for comparing the readout data on the reference chemical reactions with the data on the measured degrees of chemical reactions in the tested reagent carriers to determine the sequential positions of said measured degrees of chemical reactions; and a printing device for printing out the results of said determination on a recording sheet of paper according to the data on the sequential positions of the measured degrees of chemical reactions and the testing piece type-distinguishing data.

3,932,133
SYSTEM FOR DETECTING THE PARTICULAR CHEMICAL COMPONENT OF A TEST FLUID

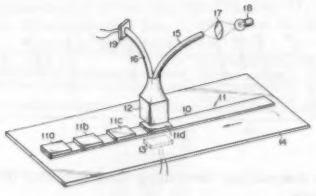
Hiroshi Ishikawa, Fussa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed July 23, 1974, Ser. No. 491,110

Claims priority, application Japan, July 31, 1973, 48-86167; July 31, 1973, 48-86170; July 31, 1973, 48-86173; Dec. 12, 1973, 48-142126; June 20, 1974, 49-72343

Int. Cl.² G01N *33/16, 21/30*

U.S. Cl. 23—253 R **9 Claims**



1. A system for detecting a particular chemical component of a test fluid comprising:

a test table including thereon a chemical reaction test piece mounted thereon, said test piece having reagent carriers attached thereto, each reagent carrier containing therein a reagent for measuring the degree of chemical reaction with the test fluid;

a first photoelectric detector including means for irradiating a light onto said reagent carrier; a first photoelectric converter receiving light reflected from said reagent carrier for generating an electric signal which is a function of said light reflected from said reagent carrier; a timer having a pre-set timing period for generating measurement command signals in accordance with the respective lengths of reaction times of reagents with a test fluid; a voltage controlled oscillator coupled to said first photoelectric converter for generating pulse signals corresponding in number to outputs from said first photoelectric converter; and a gate circuit coupled to said timer and to said voltage controlled oscillator for supplying output pulse signals corresponding in number to said measurement command signals;

means for intermittently moving one of said photoelectric detector and said test table relative to the other;

type data detection means for detecting a type data indicating the type of the chemical reaction test piece mounted on the test table, which includes a second photoelectric converter for scanning a chemical reaction test piece having reagent carriers attached onto one end side of its elongate light-permeable substrate and a light-impermeable pad attached onto the other end side and permitting the type of said reagent carriers to be coded by the number of the reagent carriers and a distance between said pad and a reagent carrier adjacent the same; means for generating a coded type data from the output of said second photoelectric converter; temporary memory means for temporarily storing therein said generated

coded type data; and means for reading out the individual type data from said temporary memory means;

an operation circuit coupled to the output of said gate circuit and to said reading out means for deriving a test from said type data read out from said temporary memory means;

a memory having comparison data pre-stored therein, said comparison data indicating the respective ranks of a plurality of test items;

means coupled to said memory and to said operation circuit for comparing the stored comparison data with the test data; and

printing means for printing the test data on a recording paper as a function of the output of said comparison means and the output of said type data detection means.

3,932,134

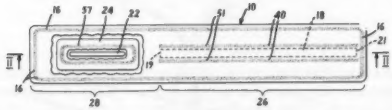
TIME-TEMPERATURE INTEGRATING INDICATOR DEVICE

Shou-Mean Fang, Lake Hiawatha, and Craig R. Hof, Boonton, both of N.J., assignors to Bio-Medical Sciences, Inc., Fairfield, N.J.

Filed Oct. 16, 1974, Ser. No. 515,165

Int. Cl.² G01N *21/06, 21/20, 11/12*

U.S. Cl. 23—253 TP **7 Claims**



1. A temperature time integrating indicator device which comprises

an elongated envelope having generally co-extensive upper and lower walls each of a gas impermeable material, the walls being sealed together in a continuous course extending about the periphery of each, a first longitudinal portion of said envelope comprising a gas generation section within said envelope and a second longitudinal portion of said envelope comprising an indicating section within said envelope,

a gas generating material disposed in the gas generation section of said envelope,

an elongated wick disposed longitudinally of the envelope with one end thereof in said gas generation section, said wick extending a distance along said envelope indicating section and the other end thereof being remote from said gas generation section,

an indicator composition deposited on said wick, said indicator composition producing a color change in the presence of gas generated by said gas generating material, and

longitudinally disposed gas barrier means extending between said upper and lower walls immediately adjacent each longitudinal side margin of said wick and along substantially the full length of said wick for inhibiting gas transport at the longitudinal side margins of said wick whereby substantially all gas absorbed by said wick makes first contact with said wick at said one end thereof.

3,932,135

METHOD AND APPARATUS FOR THE DETERMINATION OF THE OXYGEN CONTENT OF METALLIC BATHS

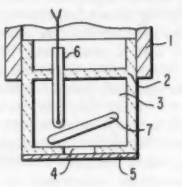
Vittorio Di Stefano, Rome; Rinaldo Grimaldi, Genoa, and Paolo Marini, Rome, all of Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed Nov. 7, 1974, Ser. No. 521,850

Int. Cl.² G01N *33/20*

U.S. Cl. 23—253 R **6 Claims**

1. Apparatus for the determination of the quantity of oxygen dissolved in a metallic bath, comprising a probe having at its tip a hollow body, a thermometric device in said hollow body, a substance in said hollow body that reacts exothermically with oxygen dissolved in the bath to form a stable oxide,



and a consumable shield comprising at least a portion of said hollow body to prevent contact between said substance and the metallic bath until after said thermometric device has reached thermal equilibrium with the bath.

3,932,136

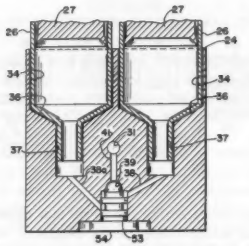
INTEGRATED FLOW PATH BLOCK

Michael E. Stickney, Burlingame, Calif., assignor to Durrum Instrument Corporation, Palo Alto, Calif.

Filed June 1, 1973, Ser. No. 365,970

Int. Cl.² B01F *15/00*; B67D *5/00*; G01N *21/00, 27/00*

U.S. Cl. 23—259 **11 Claims**



2. An integrated flow path block for mixing a plurality of reactants and presenting said mixer for analysis within a minimum volume, comprising a unitary block body, said block body having a plurality of reservoirs formed therein for separately storing the reactants, means forming a plurality of short reactant paths communicating with each of said plurality of reservoirs, said block body having a chamber in communication with said plurality of short reactant paths, said one end of said chamber being hemispheric and said chamber being cylindrical on the other end, a mixer insert formed to be received in said chamber, a first cylindrical collar formed on said mixer insert for disposition in said other end of said chamber opposite a first one of said means forming a plurality of short reactant paths, a second cylindrical collar formed on said mixer insert for disposition in said other end of said chamber opposite a second one of said means forming a plurality of short reactant paths, means blocking flow between said first and second collars, said mixer insert one end surface being a hemisphere formed adjacent to said first cylindrical collar and surrounded by and spaced from said hemispheric one end of said chamber, said second cylindrical collar having a channel extending from the exterior thereof to the interior of said mixer insert hemisphere, said mixer insert hemisphere having a plurality of holes extending therethrough in communication with said channel, whereby reactants introduced through said first and second ones of said plurality of short reactant paths flow into said one end of said chamber, and are mixed immediately downstream of said hemisphere solely due to flow turbulence, a syringe piston positioned in each of said reservoirs,

whereby advancing said syringe piston delivers reactant from a respective reservoir to said chamber, cell means in communication with said chamber for receiving and retaining a predetermined volume of mixed reactants so that reaction characteristics may be measured therein, and means for carrying a reactant efflux in communication with said cell means, whereby said predetermined volume, thermal gradients therein, and flow impedance thereto are minimized.

3,932,137

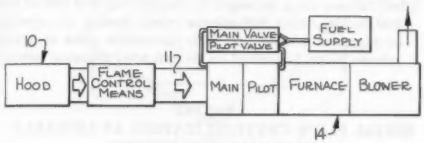
BURNER WITH AUTOMATIC HIGH-LOW OPERATION

Clifford Culpepper, Jr., Charlotte, N.C., assignor to Aero-Dyne Manufacturing, Inc., Charlotte, N.C.

Filed Nov. 8, 1973, Ser. No. 413,770

Int. Cl.² F23G *7/00*

U.S. Cl. 23—277 C **5 Claims**



1. In an arrangement for incinerating combustible debris and having means for entraining combustible debris in a flowing stream of air including fan means for inducing a flow of air and duct means for guiding the flowing stream of air and the combustible debris entrained therewith, means for supplying fuel, and burner means operatively communicating with said fuel supply means for receiving fuel therefrom and operatively interposed in said duct means for passage of the flowing stream of air and entrained debris therethrough and for disposal of entrained debris by burning, an improvement which facilitates economical operation in disposal of intermittently varying quantities of debris and comprising means for distinguishing between concentrations of conveyed entrained debris in said duct means above and below a threshold concentration and including sensing means for detecting upstream of said burner means the presence in the flowing stream of air of conveyed entrained debris, and fuel control means interposed between said fuel supply means and said burner means and operatively connected with and responsive to said concentration distinguishing means for varying the quantity of fuel delivered to the burner means in response to distinguished concentrations of conveyed entrained debris whereby the fuel required to dispose of the debris is delivered only as needed and excessive fuel usage is avoided during periods when the concentration of conveyed debris is below the threshold concentration.

3,932,138

LIQUID DECOMPOSING SYSTEM

Gerhard Louis, Hofheim, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

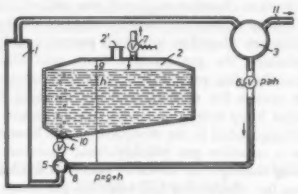
Filed Feb. 6, 1974, Ser. No. 440,267

Claims priority, application Germany, Feb. 13, 1973, 2306896

Int. Cl.² B01J *7/00*, *7/02*; H01M *8/04*

U.S. Cl. 23—281 **1 Claim**

1. In a liquid decomposing system including a decomposer having a liquid inlet at its bottom, said liquid inlet constituting the lowest point of the system, the decomposer further having a gas outlet, a liquid tank whose upper portion constitutes a normally hermetically sealed enclosure and having an outlet in the vicinity of its bottom, a buffer and condensate vessel having a gas inlet and a gas outlet, and conduit means connecting the decomposer gas outlet to the vessel inlet, the improvement comprising: a reservoir disposed below said tank; a shutoff valve connecting said reservoir to the outlet of said tank; a back pressure regulator, which is set to a fixed operating pressure; conduit means connecting the inlet end of said back pressure regulator to said gas outlet of said vessel; conduit means connecting the back pressure end of said regulator to said reservoir; and conduit means directly connecting said reservoir to said decomposer inlet.



3,932,139

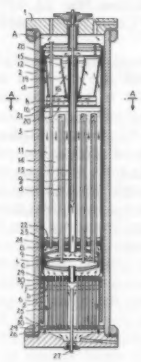
REACTOR FOR THE CATALYTIC AMMONIA SYNTHESIS AT HIGH TEMPERATURES AND PRESSURES

Marin Vilceanu, Bucharest, and Constantin Bors, Fagaras, both of Romania, assignors to Combinatul Chimic Fagaras, Fagaras, Romania

Continuation-in-part of Ser. No. 164,582, July 21, 1971, abandoned. This application Jan. 2, 1974, Ser. No. 429,783

Int. Cl.² B01J *8/04*; C01C *1/04*

U.S. Cl. 23—288 L **12 Claims**



1. A reactor for the catalytic synthesis of ammonia from a gas mixture, comprising:

a. a tubular elongated housing formed with an inlet at one end thereof for introduction of said gas mixture;

b. a sleeve received within said housing and defining an annular space therewith communicating with said inlet;

c. at heat exchanger received within said housing and axially aligned with said sleeve while defining an extension of said space with said housing, said heat exchanger comprising a pair of axially spaced-apart sheets, a plurality of heat exchanger tubes extending parallel to the axis of said housing between said tube sheets, and a packing of metal balls between said tube sheets and within an intertubular space defined between said tubes and between said tube sheets;

d. respective metal rods extending through said tubes with clearance;

e. means in said heat exchanger proximal to the other end of said housing for communicating between said annular space and said intertubular space;

f. a distribution chamber within said sleeve and communicating with said intertubular space;
g. a porous catalyst body within said sleeve between said distribution chamber and said one end of said housing;
h. a plurality of heat-exchanger tubes extending from said distribution chamber into said porous catalyst body for conducting the gas mixture from said distributor into heatexchanging relationship with said catalyst body;
i. duct means for passing said gas mixture through said catalyst body upon traversal by said mixture of said heatexchange tubes in the direction of said heat exchanger to form a reaction gas mixture, said reaction gas mixture passing through the tubes of said heat exchanger;
j. means for conducting said reaction gas mixture from said housing at said other end thereof, said means at said heat exchanger proximal to said other end of said housing being a demister for removing oil droplets from said gas mixture prior to entry of said gas mixture into said heat exchanger; and
k. means for removing collected oil from said demister at said other end of said housing.

3,932,140

FORMING HIGHLY ABSORBENT, LOW BULK DENSITY SODIUM SILICATE BY CONTACTING WITH H_2O_2 AND HEATING TO ABOUT 45° TO 60°C

Madhusudan D. Jayawant, Hockessin, and Paul C. Yates, Talleyville, both of Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Division of Ser. No. 425,970, Dec. 19, 1973, which is a continuation-in-part of Ser. No. 355,498, April 30, 1973, abandoned. This application May 22, 1974, Ser. No. 472,094

Int. Cl.² C01B *33/32*; C08H *9/06*

U.S. Cl. 23—293 A **5 Claims**

1. A process for preparing spheroidal, amorphous, water soluble alkali metal silicates having a mol ratio of SiO_2 to alkali metal oxides of 1 to 3.75, a specific nitrogen surface area between 2.5 and 7 $m^2/g.$, a bulk density of less than 0.5 g./cc., an absorbency for nonionic surfactants of from 35 to 400 percent by weight of silicate, a maximum water content of 25 percent by weight and a maximum active oxygen content of 1.33 percent by weight which comprises contacting granules of alkali metal silicate having less than 500 ppm. of transition metal ions at a temperature of from 0° to 45°C. with from 2 to 100 percent by weight of hydrogen peroxide, based on the weight of alkali metal silicate, in an aqueous solution having a concentration of from 5 to 100 percent by weight of hydrogen peroxide, diffusing the hydrogen peroxide into the hydrated alkali metal silicate structure for from about 5 minutes to about 1 hour at a temperature of from 0° to 45°C. while maintaining the alkali metal silicate in discrete particulate form having an average aggregate particle size of a maximum of 1 cm. and having a viscosity of from 5000 to 100,000 poise, and rapidly heating the silicate to from about 45° to 60°C. to destroy substantially all of the hydrogen peroxide.

3,932,141

APPARATUS FOR DETERMINING IMMUNOASSAYS OF ANTIGENS AND THEIR ANTIBODIES

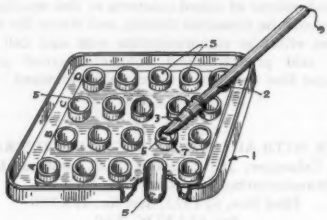
Glenn Lee Beall, Gurnee; John Dennis Dodge, Arlington Heights; Robert Francis Koschalk, Zion, and Emil Henry Soika, Lindenhurst, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed July 10, 1974, Ser. No. 487,350

Int. Cl.² G01N *33/16*

U.S. Cl. 23—259 **10 Claims**

1. A test apparatus for use in a direct radioimmunoassay for antigens or antibodies comprising:
a receptacle tray having a plurality of wells for receiving samples;
balls coated with an immunologic composition;
a ball holder having a first end and a second end, said holder arranged to receive and hold said coated balls and to deposit the balls into said w[illegible] of said receptacle tray; and



a ball-release piece arranged to fit over the first end of said ball holder, said ball-release piece having an opening arranged to release said balls therefrom when said ball-release piece is pressed on its extended exterior surface.

3,932,142

SERIAL FLOW CRYSTALLIZATION AT LINEARLY DECREASING PRESSURES

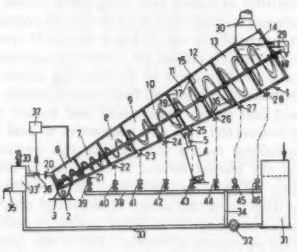
Gerbertus H. de Vries, Rotterdam, Netherlands, and Gerrit C. de Bruyn, Antwerp, Belgium, assignors to Stork Werkspoor Sugar B.V., Hengelo and Suiker Unie Holding B.V., Rotterdam, both of, Netherlands

Continuation of Ser. No. 61,635, Aug. 6, 1970, abandoned. This application Nov. 1, 1972, Ser. No. 302,850

Claims priority, application Netherlands, Sept. 26, 1969, 6914625

Int. Cl.² B01D *9/02*

U.S. Cl. 23—301 **5 Claims**



1. A process for continuously obtaining crystals of a particular substance from a continuously flowing solution thereof, which comprises the steps of:
a. providing a crystallizer having a number *n* of stages which are in serial flow relation, there being an initial stage at one end of the crystallizer and a final stage at the opposite end thereof;
b. continuously introducing equal volumes of at least saturated solution of said particular substance into each of said n stages with continuous stirring in each stage, the solution being at a predetermined pressure and a predetermined temperature;
c. introducing seed crystals of said particular substance into that solution flowing into said initial stage and maintaining the pressure in said initial stage and in all the other stages at values less than said predetermined pressure so that supersaturated solution containing seed crystals flows from said initial stage serially through the remaining stages;
d. maintaining the pressures in said n stages at linearly decreasing values from said initial stage to said final stage so that self evaporation occurs in each stage with continu-

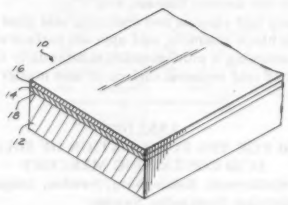
ous and substantially constant growth of said seed crystals from said initial through said final stage; and

e. continuously withdrawing said solution with size-increased seed crystals from said final stage.

3,932,143
FLAME-SPRAYED ROOFING MATERIAL

David W. Marshall, North Reading, and William R. O'Day, Jr., Concord, both of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed May 23, 1974, Ser. No. 472,952
Int. Cl.² B32B *15/04*
U.S. Cl. 29—195 **7 Claims**



1. A building product comprising a base formed of a material selected from the group consisting of wood, mineral wool, asphalt, concrete, clay, asbestos, vermiculite, and mixtures thereof; a first flame-sprayed metal coating on at least one side of said base, said first flame-sprayed metal coating selected from the group consisting of aluminum, zinc and brass, and the second flame-sprayed coating of copper applied to said first metal coating.

3,932,144
COATED METALLIC SHEET FOR USE IN MAKING A CONTAINER

Takashi Matsubara; Yuko Takeuchi, both of Nagoya; Tadashi Tanaka, Yokohama; Tatsuro Obi, Tokyo, and Akio Watanabe, Kawasaki, all of Japan, assignors to Nippon Steel Corporation and Toagosei Chemical Industry Co., Ltd., both of Tokyo, Japan

Filed Dec. 4, 1974, Ser. No. 529,555
Claims priority, application Japan, Dec. 7, 1973, 48-136083
Int. Cl.² B32B *15/08*
U.S. Cl. 29—195 **1 Claim**

1. A coated metallic sheet adapted for use as a container or can which comprises a composition coated on a material sheet selected from the group consisting of cold-rolled steel sheet, very thin nickel-plated steel sheet, aluminium-plated steel sheet and aluminium sheet, said composition consisting of resol-type thermosetting phenol-formaldehyde resin and bisphenol A type epoxy resin at the ratio of one part by weight of said phenol-formaldehyde resin to 0.2 to 1.5 part by weight of said epoxy resin, said phenol-formaldehyde resin comprising orthocresol and phenol at the weight ratio of 60:40 to 10:90, and said epoxy resin having a mean molecular weight of 800 or more.

3,932,145
FUEL PREPARATION PROCESS

Willing B. Foulke, 109 Greenridge Road, Wilmington, Del. 19805

Filed May 3, 1973, Ser. No. 356,765
Int. Cl.² C10L *1/32;* **B02C** *7/00;* **C10L** *9/00*
U.S. Cl. 44—1 R **8 Claims**

1. The method of producing a low-sulfur fuel consisting essentially of coal particles suspended in an oil comprising the steps of:

a. introducing a mixture of coal particles, and undesired particles having a higher specific gravity than coal, into a concentrator;

b. introducing oil into the concentrator;

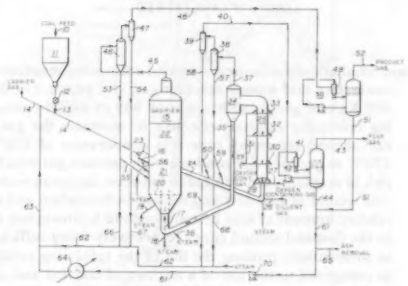
c. cleaning said mixture in the concentrator, using oil as the cleaning medium, by effecting settling of undesired particles; and

d. removing from the concentrator a suspension of coal particles in oil for use as a fuel.

3,932,146
PROCESS FOR THE FLUID BED GASIFICATION OF AGGLOMERATING COALS

Edward L. Wilson; Willard N. Mitchell, and Hermann E. von Rosenberg, all of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 11, 1974, Ser. No. 487,516
Int. Cl.² C10J *3/54*
U.S. Cl. 48—210 **10 Claims**



1. In a process wherein carbonaceous solids containing volatilizable hydrocarbons which solids tend to agglomerate at elevated temperatures are fed into a high temperature fluidized bed reactor and gasified to produce a synthetic gas, the improvement which comprises mixing fine particles of devolatilized carbonaceous material having an average particle diameter less than about 25% of that of said carbonaceous solids with said carbonaceous solids in a weight ratio between about 0.1:1 and about 5:1 at a temperature below the softening point of said carbonaceous solids and introducing the resulting mixture of fine particles of devolatilized carbonaceous material and carbonaceous solids at a temperature below said softening point into said fluidized bed reactor.

3,932,147
METHOD OF REFORMING HYDROCARBONS

Akio Okagami, Fuchu; Akira Horie, and Tsutomu Toida, both of Yokohama, all of Japan, assignors to Japan Gasoline Co., Ltd., Tokyo, Japan

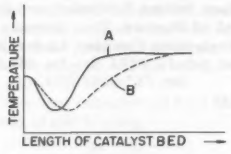
Continuation of Ser. No. 264,849, June 21, 1972, abandoned. This application Sept. 9, 1974, Ser. No. 504,556
Claims priority, application Japan, June 28, 1971, 46-46377
Int. Cl.² C01B *2/14*
U.S. Cl. 48—214 **7 Claims**

1. A process for preparing gas rich in methane by reforming hydrocarbon having an average of two or more carbon atoms per molecule, in at least two stages, which comprises;

feeding into a first reforming zone a first reactant gas consisting essentially of a mixture of steam and first hydrocarbon having a low mean molecular weight with said reactant gas containing from 1.0 to 5.0 mols of steam per one carbon atom of said first hydrocarbon, and adiabatically effecting a first reforming reaction in said first reforming zone by contacting said reactant gas, at a pressure of 0 to 100 kg/cm² gauge, with a first bed of nickel-containing reforming catalyst, effective to maintain the

gas in the first reforming zone at a temperature of 350° to 550°C, to produce a first reaction product gas consisting essentially of methane, hydrogen, carbon monoxide, carbon dioxide and steam,

feeding into a second reforming zone a second reactant gas comprising a mixture of said reaction product gas from said first zone and second hydrocarbon having a mean molecular weight higher than that of said first hydrocarbon wherein the ratio of steam per 1 carbon atom of said hydrocarbon in said second reactant gas is lower than the corresponding ratio in said first reactant gas,

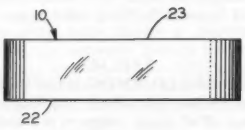


and adiabatically effecting a second reforming reaction by contacting said second reactant gas, at a pressure of 0 to 100 Kg/cm² gauge, with a second bed of nickel-containing reforming catalyst, effective to maintain the gas in said second reforming zone at a temperature of 300° to 550°C to produce a second reaction product gas which is rich in methane, the difference between the mean molecular weight of said first and second hydrocarbon and the relative amount of said first and second hydrocarbon fed to the first and second zones respectively being sufficient to substantially prolong the life of the reforming catalyst as compared to the use of a mixture of the first and second hydrocarbon as a feed for both the first and second reforming zones.

3,932,148
METHOD AND APPARATUS FOR MAKING COMPLEX ASPHERIC OPTICAL SURFACES

John J. Krewalk, Sr., West Hartford, Conn., assignor to Criterion Manufacturing Company, Inc., West Hartford, Conn.

Filed Jan. 21, 1975, Ser. No. 542,725
Int. Cl.² B24B *1/00, 13/00*
U.S. Cl. 51—284 R **10 Claims**



1. In a method for making complex aspheric optical surfaces, the steps comprising:

a. forming a thick, non-deformable integral glass block with a pair of substantially parallel flat surfaces;

b. grinding and polishing one parallel surface of said block to the desired aspheric configuration to form a thick, non-deformable integral master die block;

c. bringing into contact with said aspheric surface of said master die block an optically flat surface of a deformable glass blank;

d. drawing a vacuum through said master die block to deform said glass blank into optical contact with said aspheric surface;

e. grinding and polishing the opposite surface of said glass blank to substantially an optical flat to provide a die plate;

f. releasing said vacuum and removing said die plate from said master die block, said opposite surface of said die plate assuming a configuration substantially inverse to that of said aspheric surface of said master die block;

g. bringing said optically flat surface of said die plate into optical contact with an optically flat surface of a base die block to form a die block assembly with the aspherically configured surface of said die plate being exposed and providing a configuration substantially inverse to that of said aspheric surface of said master die block;

h. bringing into contact with said aspherically configured surface of said die block assembly an optically flat surface of a deformable glass plate;

i. drawing a vacuum through said die plate to deform said glass plate into optical contact with said aspherically configured surface;

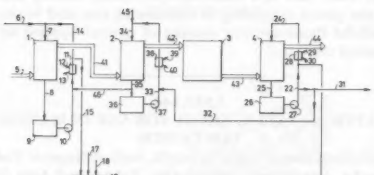
j. grinding and polishing the opposite surface of said glass plate to the desired flatness; and

k. releasing said vacuum and removing said glass plate from said die block assembly, said opposite surface of said glass plate assuming a configuration substantially conforming to that of said aspheric surface of said master die block.

3,932,149
METHOD FOR THE PURIFICATION OF SULPHURIC ACID CONTAINING MERCURY

Karl-Axel Melkersson, Helsingborg, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed May 13, 1974, Ser. No. 469,432
Claims priority, application Sweden, May 18, 1973, 7307048
Int. Cl.² B01D *53/14*
U.S. Cl. 55—72 **14 Claims**



1. A method of purifying sulphuric acid containing mercury and producing a substantially mercury-free sulphuric acid in a plant for the production of sulphuric acid according to the contact process, which involves drying moist roaster gases containing sulphur dioxide in at least two drying towers, where the major part of the water content is absorbed in the first drying tower, characterized in adding the sulphuric acid containing mercury wholly or partially deriving from sulphuric acid produced in another plant to a circulating sulphuric acid in the first drying tower, the quantity suitably measured to maintain a concentration of between 70 and 85 percent by weight;

leading sulphur trioxide, oleum or sulphuric acid to a circulation circuit of sulphuric acid in the second drying tower so that the concentration can be maintained at between 95 and 103 percent by weight;

leading a partial current from the circulating sulphuric acid in the second drying tower to the circulating sulphuric acid in the first drying tower;

removing a partial current from the circulating sulphuric acid in the first drying tower;

purifying said acid current by means of precipitating mercury; leading off said purified acid current as product acid or leading it to the absorber which is an integral part of a sulphuric acid plant using the contact process.

3,932,150
VACUUM DEAERATOR

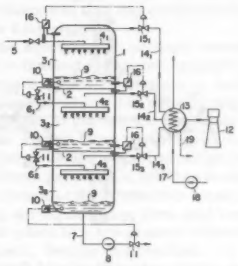
Mitsumasa Komai, Funabashi; Toshio Sawa, and Kenkichi Izumi, both of Hitachi, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Oct. 29, 1974, Ser. No. 518,616

Claims priority, application Japan, Dec. 10, 1973, 48-136853

Int. Cl.² B01D *19/00*

U.S. Cl. 55—160 **4 Claims**



1. A vacuum deaerator comprising:

a plurality of low pressure chambers having nozzles, through which is sprayed treated water therein, said chambers being disposed in a multi-stage fashion;

treated water supply pipes, each of which supplies treated water in the forward stage low pressure chamber to the nozzles in the succeeding stage low pressure chamber;

a treated water inlet pipe for supplying the treated water to nozzles in the first stage chamber;

a treated water outlet pipe for discharging treated water within the final stage low pressure chamber, to the exterior of a system;

flow rate adjusting valves, each of which attaches midway in said respective supply pipes and said outlet pipe;

a pressure reducing means for reducing the pressure in said low pressure chambers;

vent pipes, each of which communicates the respective low pressure chambers with said pressure reducing means;

vent adjusting valves, each of which attaches midway in said respective vent pipes;

temperature detecting means, each of which detects the difference between the temperature of treated water introduced by way of said nozzles into said low pressure chambers and the temperature in said low pressure chambers; and

level detecting means, each of which detects the level of treated water within said respective low pressure chambers.

3,932,151
SPRAY BOOTH

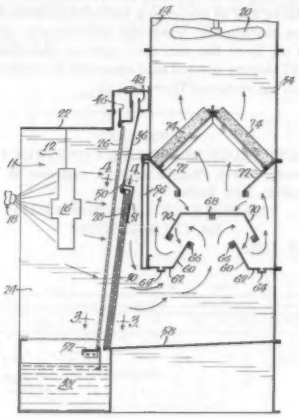
George W. Lau, Blue Island, Ill., assignor to Binks Manufacturing Company, Franklin Park, Ill.

Continuation-in-part of Ser. No. 331,505, Feb. 12, 1973, abandoned. This application May 8, 1974, Ser. No. 467,959

Int. Cl.² B01D *47/00*

U.S. Cl. 55—229 **13 Claims**

1. A paint spray booth comprising, in combination, an enclosure having side and top walls defining therein a spray painting chamber, an air inlet in one side of said chamber and an air outlet in the other side of said chamber, means for drawing air through said inlet and said chamber and discharging it through said outlet, substantially vertical wall means in said enclosure between said chamber and said outlet extending from side wall to side wall and from top to bottom thereof, said vertical wall means including a plurality of longitudinally spaced sets of vertically extending laterally spaced baffle plates, the baffles plates of the first set having broad front faces exposed to said chamber and forming a rear wall for said chamber against which spray painting operations may be performed, the baffles of said first set being mounted closely adjacent to define narrow vertical slits between said plates for escape of air from said chamber, the baffle plates of each succeeding set being staggered relative to the plates of the preceding set with each plate of each succeeding set being aligned with and laterally broader than a respective one of the spaces between the plates of the preceding set and spaced slightly rearwardly therefrom as to cause air passing through said sets of plates to be diverted into tortuous paths around the plates of each set, the sets of baffle plates succeeding said first set being shorter than the first set and suspended therebehind by an imperforate web coextensive with the upper portions of



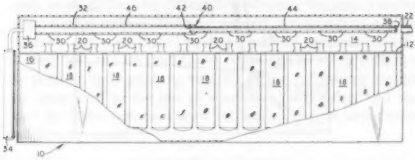
the baffle plates of the first set, said web equalizing the greater air flow over and through said first set of baffle plates and thus throughout said chamber, an oil reservoir in said enclosure beneath said baffle plates, oil in said reservoir the level in which is spaced below the lower ends of said baffle plates, means between the lower ends of said baffle plates and the oil in said reservoir for preventing passage of air below said baffle plates and for constraining the air to pass through said sets of baffle plates, means for continuously pumping oil from said reservoir to the upper ends of the baffle plates of at least the first and second sets and for gravitationally flowing a film of oil uniformly over the front faces of the baffle plates of the first and second sets, whereby particles of paint sprayed against the baffle plates of the first set and carried in the air passage through the slits between the baffle plates of the first set are entrained in the oil and flushed thereby into the reservoir, the oil flowing over said baffle plates being returned to said reservoir and having a free fall from the lower edges of said baffle plates to the level of the oil in the reservoir whereby to cause the entrained paint particles to penetrate the surface of the oil and become immersed therein and to sink to the bottom on the reservoir, the baffle plates of the first set having the side edges thereof bent rearwardly toward the baffle plates of said second set and the baffle plates of said second set having a central concave portion for catching and retaining oil and paint particles passing thereto from the preceding set of plates, the baffle plates of the last set each having the side edges thereof bent forwardly into spaced generally parallel relation with the side edges of the respective plates of the preceding set for catching and retaining oil and paint particles passing thereto from the preceding set, whereby the paint particles are entrained in the oil and deposited in the reservoir and air substantially free of paint and oil particles is delivered to said outlet, and a second baffle system in said enclosure between the last set of said baffle plates and said outlet, said

second baffle system comprising a vertical chamber rearwardly of said last set of baffle plates extending from sidewall to sidewall of said enclosure and including a vertical wall spaced rearwardly from said last set of baffle plates and terminating at its lower edge in upwardly spaced relation to the lower ends of said baffle plates to define an entrance into the lower end of said vertical chamber, a pair of laterally spaced baffles converging upwardly from the walls of said vertical chamber above said entrance, and a horizontal deflecting baffle mounted centrally in said vertical chamber above the upper ends of said converging baffles, said horizontal baffle being wider than the space between the upper ends of said converging baffles and having side edges bent downwardly into spaced generally parallel overlying relation with an adjacent one of said converging baffles, said baffles in said vertical chamber causing the air passing therethrough to strike several baffle surfaces and to travel in a tortuous path having several sharp turns therein for removing substantially all traces of paint and oil from the air, said vertical chamber having a bottom wall sloping toward said reservoir for returning to the reservoir all oil removed from the air.

3,932,152
MULTI-STAGE BLOW-PIPE CONSTRUCTION

Aldo Rotondi, North Plainfield, N.J., assignor to U.S. Filter Corporation, New York, N.Y.

Filed May 8, 1974, Ser. No. 468,211
Int. Cl.[2] B01D *46/04*
U.S. Cl. 55—302 **2 Claims**



1. In a pulse-jet dust dust collector wherein a plurality of elongate open ended filter socks are simultaneously subjected to cleaning by the abrupt emission of short duration jet pulses of cleaning gas selectively directed into the open ends thereof, the improvement comprising

terminally sealed elongate hollow blow-pipe means connected to a remote source of pressurized cleaning gas through a quick acting valve and having a plurality of selectively located apertures therein for effecting the delivery of said selectively directed pulses of said cleaning gas therefrom into the open ends of said filter socks upon actuation of said valve to effect cleaning thereof,

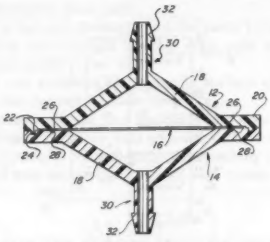
and means defining an internal gas impervious restriction at about the mid length of said blow pipe means extending inwardly from the internal defining wall of said blow pipe and disposed substantially perpendicular to the direction of flow of cleaning fluid within said blow-pipe means to abruptly reduce the cross-sectional area of said blow-pipe means available for cleaning gas flow therethrough and to increase the rate of emission of cleaning gas from said apertures disposed adjacent to said valve.

3,932,153
NEBULIZER BACTERIA FILTER

John Byrns, 7112 Kittyhawk Ave., Los Angeles, Calif. 90045

Continuation-in-part of Ser. No. 442,682, Feb. 14, 1974, abandoned. This application May 23, 1974, Ser. No. 473,141
Int. Cl.[2] B01D *27/08*
U.S. Cl. 55—511 **2 Claims**

1. A filter device comprising in combination a pair of housing sections, each section having an opening therethrough and a peripheral flange in confronting relationship with the peripheral flange of the other section to define an enclosed chamber, a continuous ridge on the peripheral flange of one section and a continuous complementary groove on the flange of the other section adapted to receive said ridge, an annular protrusion in the peripheral flange of said one section spaced from and radially outwardly of said ridge, a second groove in said flange of said other section radially spaced outwardly from said complementary groove to receive the protrusion on the flange of said one section and align said sections with respect to each other, a planar filter element disposed between said sections

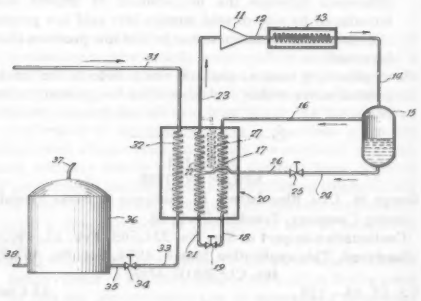


and extending radially outwardly of said flange to an extent sufficient to overlie said radially innermost groove and ridge such that the ridge on the one flange forces a portion of the filter into the groove of the flange of the other section and the protrusion on the one flange and the second groove on the flange of said other section cooperate to align said housing sections while simultaneously tensioning said filter element, and means uniting said housing sections and said filter element along the peripheral surface of said flanges to seal the filter element in said chamber.

3,932,154
REFRIGERANT APPARATUS AND PROCESS USING MULTICOMPONENT REFRIGERANT

Don Henry Coers, Salt Lake City, Utah, and Jackie Wayne Sudduth, Clarendon Hills, Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 260,982, June 8, 1972, abandoned. This application Jan. 17, 1975, Ser. No. 541,786
Int. Cl.[2] F25J *1/00*
U.S. Cl. 62—9 **2 Claims**



1. A refrigeration process consisting essentially of:

compressing a normally gaseous multicomponent refrigerant to an elevated pressure by compressor means, said refrigerant consisting essentially of about 35–55 mole percent methane, about 10–30 mole percent ethane, about 10–30 mole percent propane, and about 5–30 mole percent butane, the sum of the methane and ethane concentrations being not more than about 70 percent, and

the sum of the propane and butane concentrations being not more than about 50 percent,

cooling the high pressure refrigerant to a temperature of about 50°F to 120°F by heat rejection to the ambient to produce a refrigerant having a vapor phase and a liquid phase consisting of about 10 to 40 mole percent of the refrigerant,

directly passing the two phase refrigerant to a phase separating vessel without further cooling,

withdrawing the vapor phase as a high pressure stream from the vessel and passing said high pressure stream through a heat exchanger to cool and condense said high pressure stream to a liquid,

removing the liquefied high pressure stream of condensed liquid from the heat exchanger, expanding said liquefied high pressure stream to produce a cold low pressure stream, passing said cold low pressure stream through the heat exchanger to provide low temperature refrigeration to cool the high pressure vapor stream fed through said heat exchanger and provide extra refrigeration for removing heat from a gas product, and then feeding the cold low pressure stream to the compressor means,

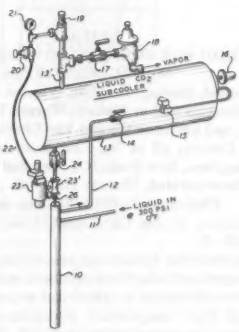
withdrawing the liquid phase from said vessel, expanding said liquid phase to a low pressure without cooling prior to expansion, feeding the resultant low pressure cool stream to an intermediate point in the heat exchanger, passing said resultant low pressure cool stream through the heat exchanger in the same direction as the stream formed from vapor removed from said vessel, combining said low pressure cool stream and said vapor stream from said vessel to form a single stream at a pressure below about 100 psig, and returning the combined stream to the inlet of said compressor; and

passing a gas product feed stream under pressure through the heat exchanger to cool the gas product feed stream by heat exchange with the refrigerant passed through said heat exchanger, to a temperature which can provide at least partial liquefaction of the gas product feed stream.

3,932,155
METHOD FOR PRODUCING CARBON DIOXIDE SNOW

Victor F. Pietrucha, Kearny; Michael E. Minard, Basking Ridge, and Gordon J. Ozmec, Berkeley Heights, all of N.J., assignors to Airco, Inc., Montvale, N.J.

Filed Nov. 13, 1974, Ser. No. 523,385
Int. Cl.² F25J *1/00*
U.S. Cl. 62—10 **8 Claims**

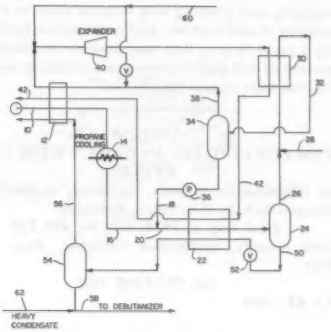


1. A method of providing refrigeration by accurately delivering carbon dioxide as soft pliable expanding snow to a point of end use comprising the steps of: introducing carbon dioxide liquid at a pressure of approximately 300 psig and at a temperature of approximately 0°F into a compartment in heat exchange relation with a tube having a plurality of different length/diameter ratios; withdrawing said carbon dioxide liquid from said compartment; sub-cooling said withdrawn liquid CO_2; and passing said sub-cooled carbon dioxide liquid to said tube to expand the same in stages and thereby form said soft pliable snow which is subsequently delivered to said point of end use while said introduced liquid CO_2 is effective to warm the walls of said tube and thereby substantial inhibit agglomeration of said snow within said tube.

3,932,156
RECOVERY OF HEAVIER HYDROCARBONS FROM NATURAL GAS

Sidney S. Stern, New York, N.Y., assignor to Hydrocarbon Research, Inc., Morristown, N.J.

Continuation of Ser. No. 294,225, Oct. 2, 1972, abandoned.
This application Mar. 22, 1974, Ser. No. 453,842
Int. Cl.² F25J *3/00*
U.S. Cl. 62—17 **1 Claim**



1. A process for recovering C_3 and higher hydrocarbons from a feed stream of natural gas largely composed of methane which comprises:

a. cooling said feed stream to a temperature of about — 25°F at a pressure of about 240 psig;

b. adding a lean oil to said cooled stream and flashing said mixture to form a gasiform overhead and a condensate;

c. adding a lean oil to said gasiform overhead and cooling to about — 25°F at a pressure of about 235 psig;

d. separating the mixture of step (c) to form the lean oil of step (b) and a gaseous overhead;

e. expanding said gaseous overhead of step (d) to about 25 psig;

f. recovering the refrigeration of said expanded overhead in the prior cooling steps;

g. flashing the condensate of step (b) to separate some methane and ethane;

h. and returning the balance of the condensate of step (b) to downstream equipment from which C_3 and higher hydrocarbons are recovered.

3,932,157
MEANS FOR MOUNTING A ROTATABLE LEVER IN A THIN WALL

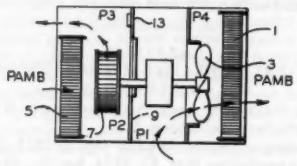
Theodore S. Bolton, and Burton F. Hammons, both of Liverpool, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 25, 1974, Ser. No. 517,976
Int. Cl.² F25D *17/04*
U.S. Cl. 62—408 **2 Claims**

1. The combination comprising:

a thin wall including an orifice having a wide portion connected to a narrow slot, said wall forming a part of the housing of an air conditioner, said air conditioner including a damper door mounted for pivotal movement to open and close a port; and

a member mountable in said wall for rotation relative to said wall, said member including a shaft, and first and second collars on said shaft, said collars having opposing faces spaced to receive portions of said wall therebetween, one of said collars being resilient and bowed towards the other collar to reduce the distance between the opposed



faces of said collars to an amount less than the thickness of said wall, said member further including an arm for engaging and pivoting said damper door in response to rotation of said member, said combination further including a projection to lock said member in place when the portion of said shaft between said collars is engaged with the end edge of said narrow slot.

3,932,158

SYSTEM FOR COOLING AN OBJECT WITH COOLANT CYCLE

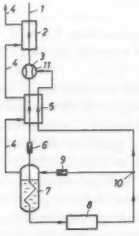
Ullrich Hildebrandt, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Aug. 6, 1974, Ser. No. 495,238

Claims priority, application Germany, Aug. 10, 1973, 2340702

Int. Cl.[2] F25B *1/06*

U.S. Cl. 62—500 **8 Claims**



1. The system for cooling of an object comprising

a first heat exchanger traversed by a stream of compressed coolant;

a first expansion stage downstream of said first heat exchanger for expanding said coolant to an intermediate pressure;

a second heat exchanger downstream of said first stage and traversed by the fluid at intermediate pressure;

a second expansion stage downstream of said second heat exchanger for expanding the fluid traversing same to a pressure substantially equal to the fluid pressure to be maintained at the inlet to said object;

a separator-evaporator having a bath of liquefied fluid and a gas space for vapor thereof above said bath;

means for passing fluid from said second expansion stage in indirect heat exchange with the said bath and into said object;

means for feeding fluid effluent from said object through a throttle into said separator-evaporator;

means for passing gas from said space through said heat exchangers in cascade, at least one of said expansion stages being constituted by an ejector having a suction side; and

means for feeding a portion of fluid emerging from said object to said suction side.

3,932,159

REFRIGERANT EXPANDER COMPRESSOR

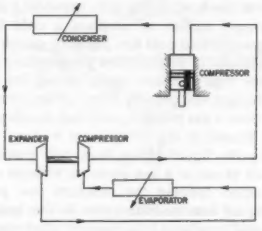
Fred L. Goldsberry, Amarillo, Tex., assignor to Enserch Corporation, Dallas, Tex.

Division of Ser. No. 422,759, Dec. 7, 1973, Pat. No. 3,864,065.

This application Sept. 20, 1974, Ser. No. 507,863

Int. Cl.[2] F25B *1/10*

U.S. Cl. 62—510 **2 Claims**



1. A refrigeration system comprising:

a condenser adapted to receive high pressure refrigerant;

an expander unit including a housing with an axially extending shaft mounted for rotation therein, said shaft having a fluid inlet passageway formed therein communicating with the discharge from said condenser and a rotary impeller mounted on said shaft for rotation therewith, said impeller including a passageway communicating between said inlet passageway and nozzle means adapted to effect refrigerant discharge at a distance from said inlet passageway and perpendicular to a radial line between said inlet passageway and said nozzle means to impart rotation to said impeller by reaction to the refrigerant discharge from said nozzle means;

an evaporator communicating with the low pressure discharge from said expander; and

a compressor connected to the outlet of said evaporator, said compressor including a rotary member in driven engagement with said impeller whereby the energy of expansion is partially recovered in the cycle.

3,932,160

METHOD FOR FORMING LOW LOSS OPTICAL WAVEGUIDE FIBERS

Irfan Camlibel, Stirling; Franklin Winston Dabby, New Providence; Douglas Arthur Pinnow, Warren Township, Somerset County, and LeGrand Gerard Van Uitert, Morris Township, Morris County, all of N.J., assignors to Western Electric Company, Inc., New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 9, 1974, Ser. No. 496,149

Int. Cl.[2] C03C *25/02*

U.S. Cl. 65—3 **14 Claims**

1. A method for fabricating an optical fiber by means of drawing a preform whose manufacture comprises the deposition of borosilicate on a cylindrical member by means of a process of high temperature pyrolysis of a first reactant chosen from the group consisting of SiH_4, $SiCl_4$, and $SiBr_4$ and a second reactant chosen from the group consisting of B_2H_6, BCl_3, and BBr_3, heating said preform to the fusing temperature of said deposited borosilicate layer, further heating said preform to the drawing temperature, and drawing said preform into a fiber, characterized in that

1. said first and second reactants are used in a ratio within the range of from 2:1 to 30:1 by volume in case said

second reactant is borane and from 4:1 to 60:1 otherwise, and

2. said high temperature pyrolysis is carried out at a temperature within the range of from 900°C to 1,200°C,

whereby said layer of borosilicate is deposited in the form of radially oriented needles.

3,932,161

FIBROUS INSULATING MATERIALS

Thomas Gordon McNish, "Silverton", 27 Silver St., Buckden, Huntingdonshire, England

Continuation of Ser. No. 95,374, Dec. 4, 1970, abandoned. This application Apr. 9, 1973, Ser. No. 349,448. The portion of the term of this patent subsequent to Mar. 14, 1989, has been disclaimed.

Int. Cl.² C03C 27/00

U.S. Cl. 65—3 2 Claims

1. A method of producing an insulating body consisting of an outer hard skin covering a mass of short bound fibrous filaments which are adhered together by a binding agent and is suitable for use as the internal lining of gas turbine engine ducts, which comprises contacting a mass of short fibrous ceramic filaments with silica sol in an amount sufficient to cause the filaments to adhere to one another to form an adherent fibrous mass, shaping the adherent mass into a predetermined form, drying the shaped mass, applying a coating of silica sol to the surface of the dried shaped fibrous mass and thereafter flame heating said applied coating at a temperature and for a period of time sufficient to form a hard, highly erosion-resistant skin on the surface of said fibrous mass to thereby form the desired insulating body.

3,932,162

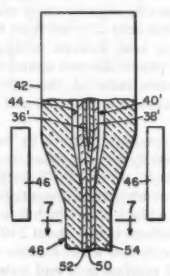
METHOD OF MAKING GLASS OPTICAL WAVEGUIDE

Michael G. Blankenship, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed June 21, 1974, Ser. No. 481,529

Int. Cl.² C03C 25/02; C03B 37/02

U.S. Cl. 65—3 15 Claims



1. A method of forming a clad optical waveguide fiber comprising the steps of

providing a substantially cylindrical mandrel,

applying a first layer of glass to the outside peripheral surface of said mandrel,

applying a second layer of glass having an index of refraction less than that of the glass of said first layer over the outside peripheral surface of said first layer,

removing said mandrel,

heating the structure so formed to the drawing temperature of the materials thereof,

drawing the heated structure to reduce the cross-sectional area thereof, thereby forming an intermediate fiber,

providing a glass tube having a hole extending axially therethrough,

disposing at least a portion of said intermediate fiber within said tube,

heating the final composite structure so formed to the drawing temperature thereof, and

drawing said final composite structure to reduce the cross-sectional area thereof and to form an optical waveguide fiber having a solid cross-section, said first layer forming the core and said second layer and said tube forming the cladding of said optical waveguide fiber.

3,932,163

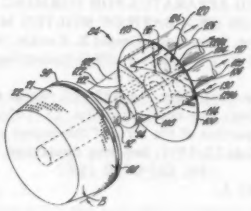
APPARATUS FOR PRODUCING A SLIVER-LIKE FIBROUS PRODUCT

Ralph M. Stream, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 425,589, Dec. 17, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,384

Int. Cl.² C03B 37/02

U.S. Cl. 65—9 9 Claims



1. Apparatus for producing a sliver-like fibrous glass product comprising:

a porous surface upon which a coherent web of discontinuous glass fibers is formed;

means defining an elongated opening reducing in size along its lengthwise dimension;

means for moving the surface and the opening relative to each other to effect advancement of a web on the surface lengthwise across the opening in a direction from the larger end of the opening to the smaller end thereof; and

means effective to draw air through the porous surface into the opening with sufficient energy to condense a coherent web on such surface laterally into a loosely associated longitudinal coherent sliver-like fibrous glass product during advancement of the web across the opening.

3,932,164

METHOD OF MANUFACTURING MINIATURE INCANDESCENT LAMPS

Karl Gebhardt, Stolberg-Busbach an Kurths-Muhle, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 8, 1974, Ser. No. 495,916

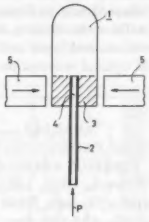
Claims priority, application Germany, Aug. 14, 1973, 2341028

Int. Cl.² C03B 5/16, 23/20

U.S. Cl. 65—32 5 Claims

1. A method of manufacturing miniature incandescent lamps having an envelope having a glass pinch and an exhaust tube extending within the cap having an inside diameter smaller than 1 mm, which comprises heating the envelope and then mechanically pinching the envelope to form a pinch and simultaneously form the seal between the exhaust tube and the heated glass cap, and blowing an inert cooling gas through the exhaust tube during the pinching operation to keep it open, the temperature and flow rate of the cooling gas being se-

lected to keep the inner wall of the exhaust tube below the transformation temperature of the glass, while the outer wall



of the exhaust tube assumes a temperature which ensures a tight seal of the exhaust tube and the envelope.

3,932,165

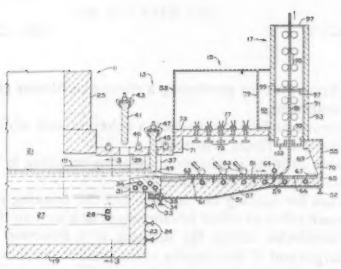
METHOD AND APPARATUS FOR FORMING A RIBBON OF GLASS ON A BATH OF MOLTEN METAL

Charles K. Edge, Sarver, and Gerald E. Kunkle, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 338,497, March 6, 1973, Pat. No. 3,843,346. This application Oct. 15, 1974, Ser. No. 514,990. The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.

Int. Cl.² C03B *18/02*

U.S. Cl. 65—65 A **15 Claims**



1. In the method of continuously forming a layer of glass on a supporting pool of molten metal wherein molten glass is discharged from a region of a pool of molten glass having an upper surface and the discharged molten glass is delivered substantially horizontally from the discharge region as a layer having a first edge portion and a second edge portion onto the supporting pool of molten metal which has an upper surface at substantially the same elevation as that of the discharged layer of glass, the improvement comprising

the step of cooling the molten glass adjacent the discharge region sufficiently to cause molten glass in the layer of molten glass within the pool of molten glass to flow toward the discharge region wherein molten glass immediately subjacent the surface of the pool of molten glass being discharged as the first edge portion is cooled at a greater rate than is molten glass at the same depth subjacent the surface of the pool of molten glass which is being discharged as the second edge portion, the difference in cooling being sufficient to cause the molten glass of both edge portions to be discharged at substantially the same velocity.

4. In an apparatus for making flat glass comprising

a glass melter; a glass refiner and conditioner having side walls extending from the glass melter and an end wall joining the side walls at their ends remote from the glass melter, the glass refiner and conditioner being adapted for containing a pool of molten glass and for adjusting its temperature for discharge and delivery to a forming chamber; a forming chamber containing a pool of molten metal for supporting glass during forming connected to the glass conditioner through a delivery facility adapted for delivering a layer of molten glass having a first edge and a second edge along a substantially horizontal path onto the pool of molten metal in the forming chamber; means for advancing the delivered glass along the surface of the pool of molten metal and cooling the glass to form a continuous sheet of glass; and means for withdrawing the formed continuous sheet of glass from the forming chamber and conveying it therefrom; the improvement comprising

means for cooling the molten glass immediately subjacent the surface of the pool of molten glass and adjacent to a region in the refiner and conditioner for discharging the layer of molten glass through the delivery facility, said cooling means being adapted for cooling a portion of molten glass to be discharged and delivered as the first edge of the layer of glass to a greater extent than a portion of molten glass to be discharged and delivered as the second edge of the layer of glass and having capacity for cooling the molten glass portions sufficiently differently for causing the molten glass of both edge portions to be discharged at substantially the same velocity.

3,932,166

LANDFILL AND SOIL CONDITIONER

Martin Vignovich, 3342 N. Senasac Ave., Long Beach, Calif. 90808, and Russell B. Sperry, 63945 Highway 97, Bend, Oreg. 97701

Continuation-in-part of Ser. No. 260,502, June 7, 1972, abandoned. This application May 15, 1974, Ser. No. 470,330

Int. Cl.² C05F *11/00;* C05B *11/04, 11/16;* C07C *63/00*

U.S. Cl. 71—11 **10 Claims**

6. A method for easily disposing of organic waste materials without polluting the environment, which comprises:

a. intimately admixing organic waste material with a water-soluble inorganic acid selected from the group consisting of hydrochloric acid, sulfuric acid, and sulfur trioxide, until said acid penetrates and contacts substantially all of the organic waste material, the ratio of acid to organic waste being between about 1:30 and 1:2 on a dry weight basis;

b. reacting the resulting mixture by heating under conditions which rapidly remove water from the reaction zone to a temperature above 200°F until the organic waste material is converted to as essentially dry, water-insoluble, humus-like black char which is substantially insoluble in alkaline solutions below about 240°F, said char including residual acids and water-soluble impurities therein;

c. removing said residual acid and water-soluble impurities from said char by washing said char with water.

3,932,167

SUBSTITUTED S-TRIAZINES AS HERBICIDAL AGENTS

Barrington Cross, Rocky Hill, and Richard William Feeny, Hightstown, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

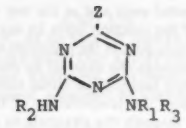
Division of Ser. No. 301,561, Oct. 27, 1972, Pat. No. 3,816,419. This application Oct. 26, 1973, Ser. No. 409,841

Int. Cl.² A01N *9/22*

U.S. Cl. 71—93 **9 Claims**

1. A method for the control of undesirable plant species comprising,

contacting the undesirable plant species or soil containing seeds of undesirable plant species with a herbicidally effective amount of a compound of the formula:



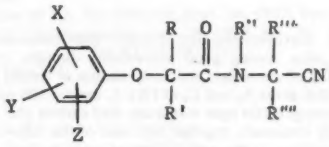
where Z is haloalkyl C_1–C_3 or haloalkenyl C_1–C_3 containing from 1 to 5 halogen atoms; R_1 and R_2 each represent hydrogen, alkyl C_1–C_4 or cyanoalkyl wherein the alkyl group contains 1 to 4 carbon atoms; R_3 is phenyl, chlorophenyl, methylphenyl, cyclohexyl, methylcyclohexyl, benzyl or 2-methylbenzyl.

3,932,168
SUBSTITUTED ARYLOXYACETAMIDO NITRILE DERIVATIVES AS CARBOHYDRATE DEPOSITION AGENTS

Robert George Stein, Kenosha, Wis., and Aldo Joseph Crovetti, Lake Forest, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 200,263, Nov. 17, 1971, abandoned. This application Sept. 14, 1973, Ser. No. 397,533
Int. Cl.² A01N *9/20*
U.S. Cl. 71—105 **3 Claims**

1. A method of increasing carbohydrate deposition in plants which comprises applying to the maturing plant 2 to 10 weeks before harvest thereof an effective amount of a compound of the formula:



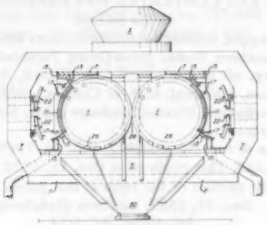
wherein X, Y and Z are selected from the group consisting of hydrogen, loweralkyl and chloro, R, R′, R″, R‴ and R⁗ are selected from the group consisting of hydrogen and loweralkyl.

3,932,169
METHOD OF MAKING BRIQUETTES WITH MACHINE HAVING AN INERT GAS SEAL

Paul B. Anthony, Jr., Upper St. Clair Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed June 28, 1973, Ser. No. 374,456
Int. Cl.² B30B *11/16*
U.S. Cl. 75—3 **6 Claims**

1. In a method of making briquettes wherein particulate matter is fed through a housing to a point between two mold rolls for compression into briquettes, and wherein the atmosphere within the housing contains a combustible dust, and wherein the escape of such dust through seal openings is a fire hazard, the improvement comprising flowing inert gas into seal openings to effect flow of said inert gas both into said machine and external of said machine thereby preventing air



from entering and containing the combustible dust within said housing.

3,932,170
USE OF SCAVENGER IN RECOVERY OF METAL VALUES

Ishwarlal D. Shah, Edina, Minn., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 19, 1974, Ser. No. 498,333
Int. Cl.² C22B *1/02*
U.S. Cl. 75—7 **4 Claims**

1. A method for the reduction of metal sulfides selected from the group consisting of copper, iron and nickel sulfides and mixtures thereof to obtain an elemental metal without production of volatile sulfur compounds which comprises:

mixing the metal sulfide with a compound reactive with sulfur, said compound selected from the group consisting of alkaline earth oxides, alkaline earth hydroxides, alkaline earth carbonates and mixtures thereof, the amount of said compound being at least sufficient to combine with all of the sulfur contained in said metal sulfide to form an alkaline earth sulfide which is stable at the reaction conditions;

contacting the mixture with a reducing gas selected from the group consisting of hydrogen, carbon monoxide and mixtures thereof at a temperature in the range of 600° to 1000°C but below the melting point of any of the components of the mixture for a time sufficient to convert substantially all of the metal content of the metal sulfides to the elemental state, and

separating elemental metal from the other components of the mixture.

3,932,171
PROCESS FOR HIGH TEMPERATURE TREATMENT OF MATERIALS

Jozef Kazimierz Tylko, Faringdon, England, assignor to Tetronics Research and Development Company, Faringdon, England

Continuation of Ser. No. 399,972, Sept. 24, 1973, abandoned, which is a division of Ser. No. 225,892, Feb. 14, 1972, Pat. No. 3,783,167. This application Apr. 19, 1974, Ser. No. 462,403
Int. Cl.² C22B *4/00*; B23K *1/10*
U.S. Cl. 75—10 R **31 Claims**

1. A process for high temperature treatment of particulate material, which comprises the steps of:

establishing a continuous electrical discharge arc column;

moving the column continuously in a closed arcuate path in such a manner as to expand said arc in the course of its movement; passing particulate material into and through the moving column so that the particles of the material travel in substantially spiral paths while passing

through the column; and collecting the arc treated material at a point of deposit spaced from the column.

3,932,172
METHOD AND CONVERTER FOR REFINING PIG-IRON INTO STEEL

Helmut Knuppel, Sulzbach-Rosenberg; Karl Brotzmann, Sulzbach-Rosenberg Hutte; Hans-Georg Fassbinder, Sulzbach-Rosenberg, all of Germany; Guy Savard, Vaudreuil, and Robert Lee, Montreal, both of Canada, assignors to Eisenwerk-Gesellschaft Maximilianshutte mbH, Sulzbach-Rosenberg, Germany

Division of Ser. No. 800,892, Feb. 20, 1969, Pat. No. 3,706,549. This application Dec. 15, 1972, Ser. No. 315,377. The portion of the term of this patent subsequent to Dec. 19, 1989, has been disclaimed.

Int. Cl.² C21C *5/34*

U.S. Cl. 75—60 **19 Claims**

1. A process for refining steel comprising:

a. adding to a refractory lined steelmaking vessel a charge comprising a mixture of hot metal and solid steel scrap, said scrap being in an amount of at least about 20% by weight of charged metal;

b. introducing into said charge at least one stream of oxygen through at least one chromium steel injector, said injector extending through the refractory lining and terminating substantially at the surface of the refractory lining and in contact with and below the surface of the liquid metal charge; surrounding each such injector with a protective jacket fluid comprising a hydrocarbon and introducing said fluid into said charge; controlling the amount of said fluid with respect to each said oxygen stream to maintain the wear rate of each such injector substantially equal to the wear rate of the adjacent refractory lining while refining the charge to a desired extent;

c. tapping the refined steel; and

d. repeating the above steps for at least about 200 times.

3,932,173
INDUCTIALLY HEATED GAS LIFT PUMP ACTION METHOD FOR MELT REDUCTION

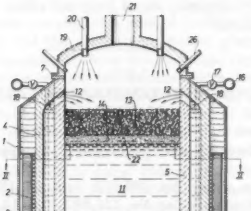
Per Harald Collin, Falun, Sweden, and Folke Karl Evald Johansson, San Remo, Italy, assignors to Allmanna Svenska Elektriska Aktiebolaget, Sweden

Filed Sept. 25, 1973, Ser. No. 400,650

Claims priority, application Sweden, Sept. 27, 1972, 12487/72

Int. Cl.² C22B *9/00*

U.S. Cl. 75—93 R **2 Claims**



1. In a method for reducing a metal oxide by introducing a material rich in metal oxide to a reaction layer resting on a metal melt, the improvement which comprises lifting molten metal from the metal melt to a level above that of the reaction layer through vertical channels which communicate at the bottom with the metal melt and at the top with a space at a level above that of the reaction layer by supplying a non-oxidizing gas to the lower part of the channels so that the molten metal is lifted up through the channel by means of the gas lift pump action, heating said molten metal inductively to a temperature greater than the temperature of the reaction layer while it is flowing through the channels to supply additional heat to the reaction layer and then allowing the thus lifted heated molten metal to exit from the top of the channels and pass down through said reaction layer and return to the metal melt.

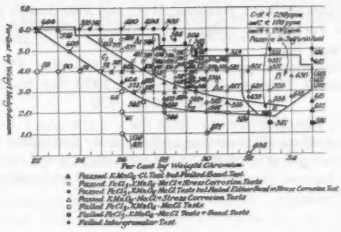
3,932,174
CHROMIUM, MOLYBDENUM FERRITIC STAINLESS STEELS

Michael A. Streicher, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 122,529, March 9, 1971, which is a continuation-in-part of Ser. No. 46,428, June 15, 1970, abandoned. This application May 30, 1974, Ser. No. 474,542

Int. Cl.² C22C *35/08, 38/22*

U.S. Cl. 75—124 **1 Claim**



1. A corrosion-resistant ferritic iron-chromium-molybdenum alloy having good postwelding ductility consisting essentially of chromium and molybdenum in weight percentages within areas A_2 and C_2 of FIG. 1, carbon 100 ppm maximum, nitrogen 200 ppm maximum, and carbon plus nitrogen 250 ppm maximum, together with one of the following eight listed additions in the weight percent range recited:

a. 0.006–0.30% Pt

b. 0.015–0.10% Ir

c. 0.020–0.10% Os

d. 0.020–0.30% Ru

e. 0.020–0.30% Ru plus not in excess of 0.60% Al

f. 0.010–0.02% Ru plus 0.15–0.20% Ni

g. 0.005–0.10% Rh

h. 0.15–0.20% Au the balance being iron and incidental impurities.

3,932,175
CHROMIUM, MOLYBDENUM FERRITIC STAINLESS STEELS

Michael A. Streicher, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 46,428, June 15, 1970. This application Mar. 9, 1971, Ser. No. 122,529

Int. Cl.² C22C *38/22*

U.S. Cl. 75—126 C **8 Claims**

1. A corrosion-resistant ferritic iron-chromium-molybdenum alloy having good post-welding ductility consisting essentially of chromium and molybdenum in the weight percentages within areas A_1, A_2, B, C_1, C_2 and D of FIG. 1, carbon 100 ppm maximum, nitrogen 200 ppm maximum, and carbon plus nitrogen 250 ppm maximum, the balance being iron and incidental impurities.

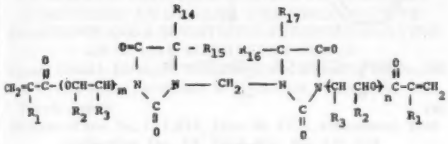
3,932,176

DIACRYLIC ACID ESTER DERIVATIVES OF BIS-HYDANTOIN COMPOUNDS

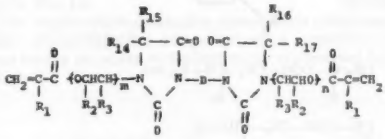
Juergen Habermeier, Pfeffingen, and Daniel Porret, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 241,386, April 5, 1972, Pat. No. 3,852,302. This application May 20, 1974, Ser. No. 471,407
Claims priority, application Switzerland, Apr. 16, 1971, 5557/71
Int. Cl.² C07D 49/32
U.S. Cl. 260—309.5 3 Claims

1. A diacrylic acid ester of a bis-hydantoin of the formula



or

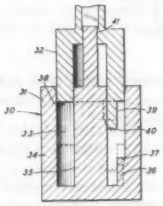


3,932,177

METHOD FOR FORMING A COLLAR

Raymond C. Coleman, Webster, N.Y., assignor to Xerox Corporation

Division of Ser. No. 290,445, Sept. 20, 1972, Pat. No. 3,851,985. This application Aug. 30, 1974, Ser. No. 502,081
Int. Cl.² B22F 5/00
U.S. Cl. 75—214 4 Claims



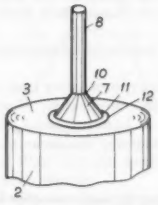
1. A method for forming a one-piece article having a first opening extending inwardly from an end surface and second opening extending from the first opening at an angle thereto, said second opening being defined by a plurality of threaded segments of a partial annular configuration, said segments being axially offset to each other along an axis of the second opening and coacting to provide the second opening with interrupted threads, each of said segments being on an end wall of a cavity extending axially towards an end surface of the body with adjacent cavities extending in opposite directions, the method comprising providing a plurality of forming surfaces movable into the configuration of the article, molding material with the forming surfaces to form the article in a single molding step, and subsequently retracting some of the forming surfaces to enable removal of the method article from the forming surfaces.

3,932,178

METHOD OF ISOSTATIC HOT PRESSING OF POWDER

Hans Gunnar Larsson, and Carl Bergman, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Oct. 16, 1972, Ser. No. 297,648
Claims priority, application Sweden, Oct. 14, 1971, 13011/71
Int. Cl.² B22F 3/14
U.S. Cl. 75—226 5 Claims



1. Method of isostatic hot pressing of powder which comprises enclosing a body of powder within a collapsible container having at least one evacuation opening, arranging an outwardly extending support within the area of the evacuation opening and held by the container, applying a funnel-shaped member having a tube attached thereto above the opening and securing the outer edge of said funnel-shaped member of the container, said funnel-shaped member when so applied leaving the evacuation opening substantially unobstructed, applying suction to said tube to evacuate gases from the powder, sealing the funnel-shaped member, and subjecting the evacuated container to heat and pressure, the pressure being sufficient to collapse the funnel-shaped member against the support.

3,932,179

ELECTROPHOTOGRAPHIC ELEMENT CONTAINING A POLYMERIC MULTI-PHASE INTERLAYER

Evelio A. Perez-Albuerne, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1973, Ser. No. 365,790
Int. Cl.² G03G 5/04
U.S. Cl. 96—1.5 14 Claims

1. In a unitary electrophotographic element comprising a conductive layer, a photoconductive layer, and a polymeric interlayer having a surface resistivity greater than about 10^{12} ohm/sq. between the conductive layer and the photoconductive layer, the improvement wherein said interlayer is a blend of at least two distinct solid polymeric phases comprising (a) an electrically insulating, film-forming, hydrophobic polymer as a first polymeric phase and (b) a film-forming, water- or alkali-soluble polymer having an electrical resistivity less than that of the hydrophobic polymer as a second polymeric phase.

3,932,180

DIRECT ALPHA TO X PHASE CONVERSION OF METAL-FREE PHTHALOCYANINE

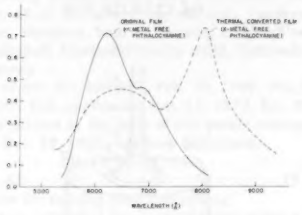
Clifford H. Griffiths, Brighton, and Michael S. Walker, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed June 4, 1973, Ser. No. 366,396
Int. Cl. C09b 47/08
U.S. Cl. 96—1.5 16 Claims

1. A process for the direct thermal conversion of the alpha polymorph of metal free phthalocyanine to the corresponding X polymorph, said process comprising:

a. providing a substrate having deposited thereon alpha metal free phthalocyanine, said deposit having an average thickness of up to about 1400 Angstrom units;

b. confining said deposit by placing in contact therewith physical means the geometry of said means affording maximum confinement of the deposit on the substrate thereby insuring the maintenance of a vapor pressure equilibrium between the deposit and vapors emanating from said deposit thereby precluding substantial evaporation thereof during thermal conversion to the corresponding X polymorph; and



c. heating said confined deposit at a rate in excess of about 10C° per minute to a temperature in the range of from about 220° to about 450°C so as to effect direct in situ conversion of at least some of the alpha metal free phthalocyanine to its corresponding X polymorph.

3,932,181

ELECTROPHOTOGRAPHIC COATING COMPOSITIONS HAVING BROMINE-CONTAINING POLYMER BINDERS

Dilip K. Ray-Chaudhuri, Somerville; Paul C. Georgoudis, Dunellen, and Hans H. Stockmann, Plainfield, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 169,075, Aug. 4, 1971, Pat. No. 3,793,293. This application July 1, 1974, Ser. No. 484,758

Int. Cl.² G03G 5/04

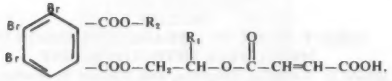
U.S. Cl. 96—1.5 **2 Claims**

1. A photoconductive composition comprising a finely divided photoconductive pigment selected from at least one member of the group consisting of zinc oxide, titanium dioxide, selenium oxide and zinc sulfide dispersed in a bromine-containing interpolymer consisting essentially of repeating units derived from at least one bromine-containing monomer corresponding to the general formulas:

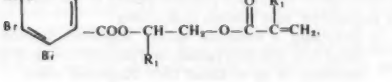
(a) $CH_2=C(R_1)-COO-CH_2-C(Br)=CH-Br$,

(b) $CH(-COO-Y)=CH-COO-CH_2-C(Br)=CH-Br$,

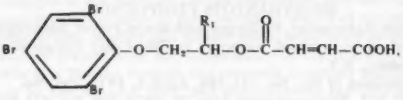
(c)



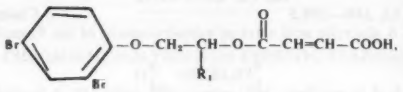
(d)



(e)

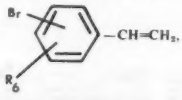


(f)



(g) $CH_2=C(R_3)-COO-CH_2-CH(OH)-CH_2-Br$,

(h)



(j) $CH_2=C(R_1)-COO-CH_2-CH(Br)-R_3$, and

(k) $CH(-COO-X)=CH-COO-CH_2-CH(Br)-R_3$;

wherein:

R_1=H, or $-CH_3$,

R_2=alkyl radical having 1 to 4 carbon atoms,

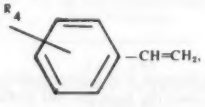
X = H or $-CH_2-CH(Br)-R_1$

Y = H or $-CH_2-C(Br)=CH-Br$;

R_6 = H or Br

and at least one monomer which does not contain bromine selected from the group consisting of compounds corresponding to the general formulas

(m)



(n) $CH_2=C(R_1)-COO-R_5$,

(o) $R_1-C(=CH-Z)-COO-R_5$,

(p) $R_1-CH=C(R_1)-COOH$ and

(q) $CH_2=CH-O-C(=O)-R_5$;

wherein:
R_1 = H or $-CH_3$,
R_4 = H, Cl, or t-butyl,
R_5 = an alkyl radical of 1 to 8 carbon atoms or a cycloalkyl radical of 3 to 8 carbon atoms, and
Z = H or $-$ COO $-$ R_5
wherein the interpolymer contains from 0.01 to 0.35 mole of bromine-containing monomer per mole of total monomers and wherein the ratio of pigment to interpolymer is in the range of from about 2:1 to 12:1 by weight.

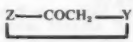
3,932,182

AN ORGANIC PHOTOCONDUCTIVE COMPOSITION COMPRISING AN ORGANIC PHOTOCONDUCTIVE COMPOUND AND A SENSITIZING COMPOUND HAVING AN ACTIVE METHYLENE GROUP

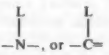
Kiyoshi Futaki; Hirokazu Tsukahara, and Kazuhiro Emoto, all of Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Division of Ser. No. 151,914, June 10, 1971, abandoned. This application Jan. 17, 1974, Ser. No. 434,325
Claims priority, application Japan, June 10, 1970, 45-50024
Int. Cl.² G03G *5/09*
U.S. Cl. 96—1.6 **10 Claims**

1. An organic photoconductive composition comprising an organic photoconductive compound and a sensitizing compound having an active methylene group represented by the formula



wherein Y is a carbonyl group, oxygen, sulfur,



(wherein L is a hydrogen or an alkyl group); Z is a residue necessary to form 5- or 6-membered ring; said sensitizing compound being present in an amount of 1 to 50 parts by weight per 100 parts by weight of said organic photoconductive compound.

3,932,183

PROCESS FOR FABRICATING AN IMPROVED CATHODE RAY TUBE SCREEN STRUCTURE

Mahlon B. Fisher, Skaneateles; Anthony V. Gallaro, Auburn, and G. Norman Williams, Seneca Falls, all of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Division of Ser. No. 412,143, Nov. 2, 1973. This application Oct. 15, 1974, Ser. No. 514,509
Int. Cl.² G03C *5/00, 7/00*
U.S. Cl. 96—36.1 **2 Claims**

1. In a color cathode ray tube viewing panel whereon a patterned cathodoluminescent screen structure formed of first, second and third pattern elements is disposed on an interior surface of said panel relative to a multiple aperture patterned mask spacedly positioned adjacent thereto, a process for forming an improved multi-windowed screen structure defined by a webbing of uniform opaque interstices disposed on the interior surface of said panel prior to the fabrication of the phosphor screen thereon, each of said window areas having a layer of selected substantially transparent optical filter material disposed therein and evidencing a peripheral shaping free of indentations similar to that of the formative aperture in said pattern mask, said process comprising the steps of:

coating the interior of said panel with a primary layer of a liquid mixture of a positive photosensitive resist material and a first organometallic luster compound;
drying said coated panel;
exposing said primary coating by directing actinic radiations from two discrete positions through the multiple apertures in said pattern mask to effect degradation of those portions of the primary positive resist coating in the areas subsequently occupied by said second and third filter pattern windows;
developing said exposed primary coating with positive photoresist developer by removing the degraded exposed coating material in said second and third filter pattern window areas;
rinsing said developed panel to remove development materials;
heating said patterned panel in a controlled oxygen atmosphere to thermally decompose said resist material and oxidize said first luster material to form and adhere a substantially continuous and transparent primary layer of said first optical filter material having second and third open filter windows therein;
coating said panel with a secondary layer of a liquid mixture of said positive photosensitive resist material and a second organometallic luster compound;
drying said coated panel;
exposing said secondary coating by directing actinic radiation from two positions through said patterned mask to effect degradation of said secondary positive resist coating in the areas subsequently occupied by said first and third filter pattern windows;
developing said exposed secondary coating with positive photoresist developer by removing the degraded exposed coating material in said first and third filter pattern window areas;
rinsing said developed panel to remove development materials;
heating said patterned panel in a controlled oxygen atmosphere to thermally decompose said resist material and oxidize said second luster material to form and adhere a substantially continuous and transparent secondary layer of said second optical filter material having an open third filter window therein and a defined first filter window displaying said first optical filter material therein;
coating said panel with a tertiary layer of a liquid mixture of said positive photosensitive resist material and a third organometallic luster compound;
drying said coated panel;
exposing said tertiary coating by directing actinic radiations from two positions through said patterned mask to effect degradation of said tertiary positive resist coating in the areas occuppied by said first, and second filter pattern windows;
developing said exposed tertiary coating with positive photoresist developer by removing the degraded exposed coating material in said first and second filter pattern window areas;
rinsing said developed panel to remove development materials; and
heating said patterned panel in a controlled oxygen atmosphere to thermally decompose said resist material and oxidize said third luster material to form and adhere a substantially continuous and transparent tertiary layer of said third optical filter material having open first and second filter windows therein displaying said first and second optical filter material respectively therein, said third filter window associated with said tertiary layer being defined by the third pattern superposed open windows in said primary and secondary filter layers; said superimposed primary, secondary and tertiary filter layers providing in combination a substantially opaque uniform interstitial webbing fully surrounding each of the respective filter windows in said screen structure whereof the uniform peripheral encompassment of each filter window is free of indentations.

3,932,184

FABRICATION OF MICROLENSES

Leonard George Cohen, Matawan, and Martin Victor Schneider, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 29, 1973, Ser. No. 364,501
Int. Cl.[2] G03C 5/00, 11/00
U.S. Cl. 96—38.3 5 Claims

1. A method for forming a microlens on one end surface of an optical fiber that comprises a relatively high index-of-refraction cylindrical core having a relatively low index-of-refraction cladding disposed thereabout, said method comprising the steps of:

coating the entire surface of said one end of said fiber with a negative transparent photoresist material,

exposing to radiation only a selected portion of the material coated on said end surface by directing at said material a radiant beam whose cross-sectional area approximates that of said core and is much less than the cross-sectional area of said core and cladding, said selected portion including the material that covers the entire core area of the fiber but excludes the major portion of the material that covers the cladding of the fiber,

removing the unexposed portion of said material,

and baking said remaining exposed portion to cause it to flow slightly, thereby to harden said exposed portion and to smooth the contour thereof.

3,932,185

MULTI-LAYER PHOTOSENSITIVE MATERIAL FOR COLOR PHOTOGRAPHY

Katsumi Matsuura, Hino, Japan, assignor to Konishiroku Photo Industry Co., Inc., Tokyo, Japan

Filed Aug. 12, 1974, Ser. No. 496,641
Claims priority, application Japan, Aug. 16, 1973, 48-91265
Int. Cl.[2] G03C 1/76
U.S. Cl. 96—74 9 Claims

1. A multi-layer photosensitive material for color photography comprising a support and coated thereon, a first color image-forming layer unit composed of a red-sensitive silver halide emulsion, a second color image-forming layer unit composed of a green-sensitive silver halide emulsion and a third color image-forming layer unit composed of a blur-sensitive silver halide emulsion; characterized in that at least one of said color image-forming layer units has a composite layer structure including a lower layer and an upper layer which are positioned in sequence from the support, said upper layer has a higher sensitivity and a lower maximum developed color density than said lower layer, and at least one of said upper layer and lower layer contains a mercaptan type development inhibitor-releasing compound capable of reacting with an oxidation product of a primary aromatic amine to form a substantially colorless compound.

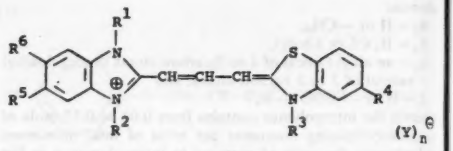
3,932,186

SPECTRALLY SENSITIZED PHOTOGRAPHIC SILVER HALIDE EMULSION

Alan L. Borror, Lexington; Ruth Linda Hill, Cambridge, and Bernard Zuckerman, Framingham, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 2, 1974, Ser. No. 430,222
Int. Cl.[2] G03C 1/40, 1/14, 1/18
U.S. Cl. 96—77 14 Claims

1. A photosensitive silver halide emulsion containing as a green sensitizer a benzimidazolo-thiacarbocyanine dye of the formula:



wherein R^1 and R^2 are lower alkyl; R^3 is sulfoalkyl or carboxyalkyl each having an alkylene chain of from 1 to 4 carbon atoms inclusive; R^4 is hydrogen, halogen, lower alkyl, lower carbalkoxy, lower alkoxy or acetamido; R^5 is halogen, cyano or carbalkoxy; R^6 is hydrogen or halogen; Y is an anion customary in the cyanine dye art; and n is 0 or 1.

8. A photosensitive silver halide emulsion as defined in claim 1 having associated therewith a dye which is a silver halide developing agent.

3,932,187

PHOTOGRAPHIC PROJECTING STRIP FILM IN A CASSETTE

John F. Batter, Jr., Lincoln, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 277,150, Feb. 17, 1972, abandoned. This application Mar. 14, 1973, Ser. No. 341,135
Int. Cl.[2] G03C 3/02
U.S. Cl. 96—78 1 Claim

1. A photographic product for use with apparatus including a rotatable member, said product comprising an elongated strip of photographic material adapted to be operably connected to a rotatable member to effect its coiling therearound responsive to the rotation of the member, an actuating element on said strip of photographic material extending above a surface thereof, and at least one discontinuity in said strip of photographic material spaced from said actuating element a predetermined distance to receive said actuating element as the section of said strip of photographic material containing said actuating element and said discontinuity is coiled around the rotatable member, whereby said strip can be coiled smoothly around the rotatable member over said actuating element with a uniform radius.

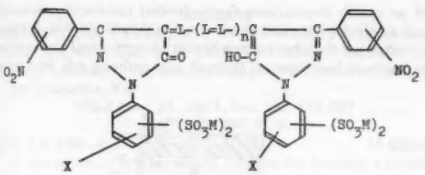
3,932,188

SILVER HALIDE PHOTOGRAPHIC LIGHTSENSITIVE MATERIAL

Akira Tanaka; Kiyoshi Futaki, and Bunzo Ueda, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Japan

Filed Feb. 24, 1975, Ser. No. 552,262
Claims priority, application Japan, Feb. 25, 1974, 49-21524
Int. Cl.[2] G03C 1/84
U.S. Cl. 96—84 R 7 Claims

1. A silver halide photographic lightsensitive material having on one or both sides of a support a layer containing at least one of dyes represented by the general formula:



(wherein X is selected from the group consisting of hydrogen atom, hydroxyl group, halogen atom and lower alkyl group; L is methine group which may be substituted with lower alkyl group at meso-position; M is selected from the group consisting of hydrogen atom, alkali metal and ammonium group; and *n* is 1 or 2).

3,932,189

THERMODEVELOPABLE PHOTOGRAPHIC MATERIAL CONTAINING HIGH SILVER ION CONDUCTING SUBSTANCE

Takuji Kaneda; Makoto Nagao; Satoru Honjo, and Eiichi Mizuki, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 10, 1974, Ser. No. 432,252

Claims priority, application Japan, Jan. 12, 1973, 48-6402

Int. Cl.² G03C *1/02*

U.S. Cl. 96—114.6 **11 Claims**

1. A thermodevelopable photographic material comprising a support having thereon a layer composed of (a) a high silver ion conducting substance having an ion conductivity at 25°C of at least 1×10^{-3} $(\Omega\ cm)^{-1}$ or a mixture of said high silver ion conducting substance with silver, and (b) a weak reducing agent, said high silver ion conducting substance being selected from the group consisting of silver iodide phosphate, silver iodide tungstate, a double salt of silver iodide and a tetra alkylammonium iodide, and a double salt of silver iodide and a polymethonium iodide.

3,932,190

PLASTER OF PARIS BANDAGES BONDED WITH MINIMAL PROPORTIONS OF HYDROLYZED POLYVINYL ESTERS

David F. Smith, 315 Wahington Blvd., Sea Girt, N.J. 08750

Filed July 30, 1973, Ser. No. 383,691

Int. Cl.² C04B *11/14*

U.S. Cl. 106—111 **13 Claims**

1. A dry, bonded plaster of Paris bandage comprising a flexible, inert, porous, water absorbent backing material coated to the extent of from 40 to 50 grams per square foot with an essentially uniform mixture comprising a major proportion of settable, powdered plaster of Paris:
   1. from 0.5 to 2.5 per cent of the weight of plaster of finely divided potassium sulfate; and
   2. a mixture of a least two hydrolyzed polyvinyl esters selected from the group consisting of acetate, propionate and butyrate in a total amount of from 0.1 to 1 per cent of the weight of plaster and having a degree of hydrolysis of from 80 to 100 per cent and a viscosity of between 5 to 80 centipoise in a 4 per cent aqueous solution at 20°C as determined by the Hoeppler falling-ball method, where at least one of the esters is present in an amount of up to 100 per cent of the weight of the first and having a degree of hydrolysis and a viscosity respectively in the same range but substantially different in at least one of the properties of degree of hydrolysis and viscosity.

3,932,191

ELECTRODEPOSITABLE COATING COMPOSITIONS CONTAINING THEREIN CELLULOSE ACETATE BUTYRATE AND HAVING IMPROVED ADHESION

Robert D. Jerabek, Glenshaw, and William J. Geiger, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 123,429, March 11, 1971, abandoned. This application Oct. 10, 1973, Ser. No. 405,240

Int. Cl.² C08L *1/14, 91/00;* **C25D** *13/06*

U.S. Cl. 106—178 **3 Claims**

1. An aqueous electrodepositable composition comprising an ionically solubilized water-dispersed vehicle selected from the class consisting of a base solubilized synthetic polycarboxylic acid resin vehicle and an acid solubilized polybasic resin vehicle and from about 0.5 to about 2 percent by weight, based on the total weight of resinous vehicle solids of cellulose acetate butyrate which has at least 25 percent by weight of the ester units substituted with the butyryl residue.

3,932,192

PAPER COATING MATERIAL CONTAINING PULLULAN

Seizo Nakashio, Nishinomiya; Noriyuki Sekine, Toyonaka; Nobuhiro Toyota, Ibaragi; Fumio Fujita, Osaka, and Masahiro Domoto, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Hayashibara Biochemical Laboratories, Inc., both of, Japan

Filed Sept. 24, 1974, Ser. No. 508,731

Claims priority, application Japan, Sept. 29, 1973, 48-109943

Int. Cl.² C08C *5/00*

U.S. Cl. 106—204 **3 Claims**

1. A paper-coating composition comprising pullulan and at least one pigment selected from the group consisting of clay, calcium carbonate, titanium dioxide, satin white and aluminum hydroxide.

3,932,193

FORMING SIZE FOR TEXTILE GLASS FIBERS

Roy R. Graham, Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 29, 1974, Ser. No. 464,861

Int. Cl.² C08L *3/00;* **C09J** *3/06*

U.S. Cl. 106—211 **4 Claims**

1. In an aqueous glass fiber size comprising a starch, vegetable oil as a lubricant, a textile softener, and a nonionic wetting agent, the improvement comprising said size containing 150 to 100 percent by weight of said nonionic wetting agents based on the weight of said lubricant.

3,932,194

MILLED TALC MATERIAL AND MILLING METHOD

Richard Seyb Lamar, Littleton, and Norman Bach Scheffel, Parker, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Feb. 11, 1974, Ser. No. 441,192
Int. Cl.² C09C 1/02
U.S. Cl. 106—306 15 Claims

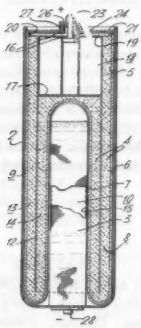
1. A milled talc material containing about 20 to about 35 percent tremolite and having a particle size distribution such that no more than 5% of the particles are larger than 10 microns, no more than 12% of the particles are larger than 5 microns and no more than 15 percent of the particles are smaller than 0.3 micron in equivalent spherical diameter.

3,932,195

ELECTRIC CELLS

Leslie Samuel Evans, Reading, and John Richard Harbar, Wantage, both of England, assignors to Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Apr. 29, 1975, Ser. No. 572,827
Claims priority, application United Kingdom, May 1, 1974, 19189/74
Int. Cl.² H01M 35/04, 43/00
U.S. Cl. 136—6 FS 22 Claims



1. An electric cell for use with a liquid anode, and a liquid cathode, comprising a solid electrolyte having at least two portions disposed in contraposition so as to provide between them on one side a space for the liquid cathode, the liquid anode being arranged to lie outside the said space on the other sides of each of the said portions, and current collecting means of extended surface area disposed in the said space and substantially dividing the space into two sub-spaces, each sub-space being bounded on one side by a surface of one side of one of the portions of the solid electrolyte and on the other side by a part of the current collecting means having an extended surface area at least equal to a major proportion of the area of the said surface.

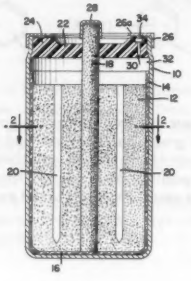
3,932,196

PRIMARY DRY CELL WITH GAS-VENTING PASSAGEWAY THROUGH THE CATHODE MIX

Vicente S. Alberto, Parma, and David G. Clash, Fairview Park, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,595
Int. Cl.² H01M 6/06
U.S. Cl. 136—107 10 Claims

1. A primary dry cell comprising a metal anode cup having an open end which is gas-tightly sealed by a closure including a vent and having a cathode mix therein comprising particles of an oxidic depolarizer, finely-divided conductive material and an electrolyte, said closure and said cathode mix defining a void space therebetween, wherein a longitudinal gas-venting passageway hole extends through said cathode mix into communication with said void space to thereby enable gas normally entrapped near the bottom of said anode cup to pass freely through said cathode mix and into said void space from whence the gas can escape through said vent.

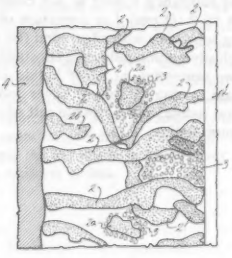


3,932,197

METHOD FOR CATALYZING A FUEL CELL ELECTRODE AND AN ELECTRODE SO PRODUCED

Murray Katz, Newington, and Arthur Kaufman, Bloomfield, both of Conn., assignors to Union Technologies Corporation, East Hartford, Conn.

Filed Dec. 18, 1974, Ser. No. 533,918
Int. Cl.² H01M 4/86, 4/88
U.S. Cl. 136—120 FC 15 Claims



1. A process for catalyzing a inert, porous conducting particle, hydrophobic bonded, substrate supported electrochemical cell electrode which comprises contacting the inert, porous conducting particle, hydrophobic-bonded portion of said electrode with the electrolyte composition applying a non-alternating electrical potential across the electrode between the substrate and the electrolyte, the electrical potential being of sufficient magnitude to increase the rate at which the electrolyte enters and fills the porous conducting particles, then causing a soluble catalyst-containing compound to enter into solution in the electrolyte within the electrode structure and depositing insoluble catalyst from said electrolyte solution onto the conducting particles.

3,932,198
COATING SOLUTION HAVING TRIVALENT CHROMIUM AND MANGANESE FOR COATING METAL SURFACES

George Schneider, Trevose, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed May 24, 1974, Ser. No. 473,097
Int. Cl.² C23F 7/26
U.S. Cl. 148—6.2 15 Claims

1. An aqueous acidic coating solution for forming a conversion coating on a metallic surface, consisting essentially of trivalent chromium and one or more cations selected from the group consisting of manganese, bismuth, antimony, tin, zinc and molybdenum, the trivalent chromium present in an amount of from about 0.1 g/l to about 2 g/l and the cation present in a stoichiometric equivalent amount of from about 0.2 g/l to about 1.0 g/l of manganese.

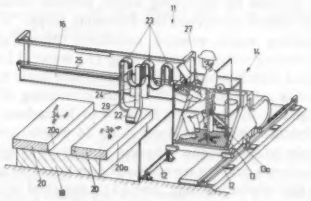
10. A process comprising contacting a metallic surface with a coating solution consisting essentially of trivalent chromium and one or more cations selected from the group consisting of manganese, bismuth, antimony, tin, zinc and molybdenum, the trivalent chromium present in an amount of from about 0.1 g/l to about 2 g/l and the cation present in a stoichiometric equivalent amount of from about 0.2 g/l to about 1.0 g/l of manganese.

12. The process of claim 10, wherein the surface is thereafter contacted with an aqueous passivating rinse solution and then dried, the rinse solution comprising a passivating agent selected from the group consisting of an amine, urea, and alkali metal nitrates.

3,932,199
PROCESS FOR THE FLAME-SCARFING OF FAULTY AREAS

Alfred Lucht, Bickenbach, and Erwin Henn, Urbach, both of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed July 17, 1973, Ser. No. 379,974
Claims priority, application Germany, Aug. 4, 1972, 2238460
Int. Cl.² B23K 7/00, 9/00
U.S. Cl. 148—9 C 13 Claims



1. In a process for flame-scarfing surface defects on a workpiece such as ingots, slabs or the like by means of at least one flame-scarfing torch characterized in traversing the workpiece until the torch is disposed above the workpiece at the beginning of the surface defect, halting the movement of the torch while the torch is disposed at the beginning of the surface defect, turning on various torch operating parameters including feeding gas to the torch while the torch is halted at the beginning of the surface defect, after the various torch operating parameters have been turned on setting the forward motion parameter of the torch to permit the torch to begin traversing the workpiece over the surface defect, maintaining the gas flow parameter setting unchanged throughout the time and distance that the torch traverses the surface defect, immediately prior to reaching the end of the surface defect changing at least one of the forward motion parameter and distance from workpiece parameter without changing the gas flow setting and with the change in forward motion parameter being an acceleration thereof and the change in distance from the workpiece parameter being an increase in distance thereof to diminish the affect of the flame from the torch while the torch completes its traversal over the surface defect and while the flow of gas is continued to the torch, and thereby continuing to apply the flame of the torch toward the surface defect when the at least one parameter has been changed until the torch has completely traversed the surface defect.

3,932,200
FLUX FOR A BUILD-UP WELDING

Katao Miyano; Shunichi Tomizuka; Takao Adachi, all of Muroran; Tomoo Takenouchi; Satoshi Kondo, both of Noboribetsu; Akira Hirama, and Yasuo Endo, both of Muroran, all of Japan, assignors to Japan Steel Works, Ltd., Tokyo, Japan

Filed Jan. 31, 1974, Ser. No. 438,349
Claims priority, application Japan, June 19, 1973, 48-68304
Int. Cl.² B23K 9/04, 35/362
U.S. Cl. 148—26 4 Claims

1. A flux for build-up horizontal electroslag welding, consisting of a flux prepared by fusing together 50–90% by weight of calcium fluoride, 10 to 40% by weight of alumina and an effective amount up to 20% by weight of one or more compounds selected from the group consisting of 0.5 to 7% by weight of an iron oxide 2 to 10% by weight of silica, 1 to 17% by weight of manganese oxide and 2 to 10% by weight of chrome oxide, and 0 to 5% by weight of zirconium dioxide.

3,932,201
MAGNESIUM OXIDE COATING COMPOSITION AND PROCESS

John F. Steger, Crystal Lake, Ill., assignor to Morton-Norwich Products, Inc., Chicago, Ill.

Filed Feb. 24, 1975, Ser. No. 552,041
Int. Cl.² B23K 35/24
U.S. Cl. 148—27 9 Claims

1. A magnesium oxide composition for coating onto silicon-containing steel sheet, said composition comprising a major proportion of magnesium oxide and a minor proportion of zinc permanganate and magnesium sulfate, wherein the concentration of zinc permanganate is from about 4 to about 16 parts per 100 parts of magnesium oxide and the concentration of magnesium sulfate is at least about 50 parts per 100 parts of zinc permanganate.

3,932,202
MAGNESIA COATINGS FOR FERROUS SUBSTRATES COMPRISING AMORPHOUS MAGNESIA-SILICA COMPLEXES

Leonard S. Lee, Daly City; Samuel W. Sopp, Foster City, and Howard M. Siegel, Pacifica, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 360,257, May 14, 1973, abandoned. This application Nov. 5, 1974, Ser. No. 521,015
Int. Cl.² H01F 1/04
U.S. Cl. 148—31.5 5 Claims

1. A method of producing a separator and electrical insulating coating on magnetic silicon steel which comprises applying a coating composition comprising MgO, $Mg(OH)_2$ or mixtures thereof, at least one lithium compound and at least one magnesia-silica complex containing from about 0.001 to 2.0 percent by weight of an alkali metal oxide, or hydroxide, wherein the mole ratio of the $MgO:SiO_2$ is from about 1:25 to 14:1, said magnesia-silica complex being amorphous as indicated by its X-ray powder diffraction pattern and exhibiting the following differential thermal behavior characteristics: an endothermic peak at about 250°C., an exothermic peak at about 820°C. and at about 980°C.; to magnetic ferrous material and annealing said material at an elevated temperature,

wherein the annealing occurs at about 950°–1500°C. for from about 2 to 50 hours, wherein the lithium compound is selected from the group consisting of lithium carbonate, lithium hydroxide, lithium fluoride, lithium borate, lithium acetate, lithium sulfate, lithium oxide, lithium phosphate, lithium silicate, lithium dichromate, and lithium nitrate, wherein said coating composition contains from about 2 to about 200 parts by weight of magnesia-silica complex and from about 0.01 to about 30 parts by weight of lithium compound per 100 parts by weight of MgO.

3,932,203

MAGNESIA COATINGS FOR FERROUS SUBSTRATES COMPRISING AMORPHOUS MAGNESIA-SILICA COMPLEXES

Leonard S. Lee, Daly City; Yoshio Uyeda, San Mateo, and Samuel W. Sopp, Foster City, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 486,790, July 9, 1974, abandoned, which is a continuation of Ser. No. 267,276, June 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 195,010, Nov. 2, 1971, abandoned. This application Oct. 7, 1974, Ser. No. 512,562

Int. Cl.² H01F *1/04*

U.S. Cl. 148—31.5 **22 Claims**

1. In the process of making magnetic ferrous material wherein the magnetic ferrous material is coated with a composition comprising a material selected from the group consisting of MgO, $Mg(OH)_2$ and mixtures thereof and annealed, the improvement which comprises the addition to the MgO or $Mg(OH)_2$ coating composition of at least one magnesia-silica complex containing from about 0.001 to 2.0% by weight of an alkali metal oxide, wherein the mole ratio of the $MgO:SiO_2$ is from about 1:25 to 14:1, said magnesia-silica complex being amorphous as indicated by its X-ray powder diffraction pattern and exhibiting the following differential thermal behavior characteristics: an endothermic peak at about 250°C.; an exothermic peak at about 820°C. and at 980°C.

3,932,204

COBALT-ALUMINUM MAGNETIC MATERIALS WITH HIGH COERCIVE FORCE

Hakaru Masumoto, and Kiyoshi Watanabe, both of Sendai, Japan, assignors to The Foundation: The Research Institute of Electric and Magnetic Alloys, Sendai, Japan

Division of Ser. No. 873,752, Oct. 31, 1969, abandoned, which is a continuation-in-part of Ser. No. 759,823, Sept. 10, 1968, abandoned, which is a continuation of Ser. No. 398,008, Sept. 21, 1964, abandoned. This application Sept. 7, 1971, Ser. No. 178,208

Int. Cl. H01f *1/02*

U.S. Cl. 148—103 **1 Claim**

1. A method of manufacturing high coercive force permanent magnets, comprising heating an alloy consisting essentially of about 66 to 95% by weight of cobalt, 5 to 25% by weight of aluminum, and a member selected from the group consisting of about 3.8% Ti, about 5.8% Mo, about 3.8% Cr, about 4.4% V and about 10.7% W, to a temperature above the $\epsilon + \zeta$ binary region, quenching the alloy from a temperature above the solid solubility line to a temperature below the upper boundary of the $\epsilon + \zeta$ binary region at a rate to produce a substantially single-phase solid solution of ϵ, heating the alloy in said binary region at a temperature above 200°C. for several minutes to several hundred hours to precipitate fine particles of ferro-magnetic ζ in a matrix of non-magnetic ϵ, and magnetizing the product thus obtained in a strong magnetic field to obtain a permanent magnet having a high coercive force, said member being effective to increase the coercive force substantially above the coercive force of the same cobalt-aluminum alloy without said member.

3,932,205

HEAT TREATING PROCESS FOR ACHIEVING FORCED AGEING

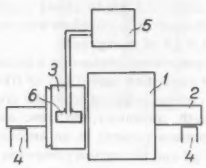
Gosta Lindholm, and Erling Astrom, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 31, 1975, Ser. No. 563,503

Claims priority, application Sweden, Apr. 11, 1974, 74049776

Int. Cl.² C21D *1/04, 1/10;* H01R *43/00*

U.S. Cl. 148—108 **1 Claim**



1. Heat treating process for forced ageing of a commutator intended for a rotary electrical machine by supplying heat during rotation, which comprises rotating the commutator in the field of a coil intended for generating a high-frequency magnetic field arranged radially outside the commutator in such a way that said field is directed substantially perpendicular to the commutator surface, and supplying to said coil a current, the frequency of which exceeds 1,000 Hz.

3,932,206

PROCESS FOR DE-INKING PRINTED WASTE CELLULOSIC FIBROUS MATERIAL

Robert H. Illingworth, Madison, and Frank W. Lorey, Ramsey, both of N.J., assignors to Garden State Paper Co., Inc., Garfield, N.J.

Continuation of Ser. No. 247,683, April 26, 1972, abandoned. This application May 28, 1974, Ser. No. 473,933

Int. Cl.² D21C *5/02*

U.S. Cl. 162—5 **29 Claims**

1. A process for de-inking waste, printed cellulosic fibrous material which comprises the following steps:

a. Adding waste, printed, cellulosic fibrous material to a de-inking solution comprising (1) water, (2) a de-inking agent which is biodegradable and non-toxic to aquatic life and is selected from the group consisting of ethoxylated aliphatic di-ols having from 14 to 30 carbon atoms in the aliphatic chain and from 8 to 24 ethyleneoxy units per mole of di-ols and wherein the hydroxy groups in the di-ols are present on adjacent non-terminal carbon atoms in the aliphatic chain; and (3) a material present in sufficient quantity to maintain an alkaline pH of the de-inking solution between about 7.0 and 11.5;

b. Contacting said printed material with the de-inking solution until the ink separates from the fibers; and

c. Washing the de-inked cellulosic fibrous material.

9. A process for de-inking waste, printed cellulosic fibrous material to produce a pulp for use in making newsprint, which comprises the following steps:

a. Adding waste, printed, cellulosic fibrous material to a de-inking solution comprising (1) water, (2) a de-inking agent which is biodegradable and non-toxic to aquatic life and is selected from the group consisting of ethoxylated aliphatic mono-ols having about 14 to 15 carbon atoms in the aliphatic chain and about 8 to 12 ethyleneoxy units per mole of said mono-ol; and (3) a material present in sufficient quantity to maintain an alkaline pH of the de-inking solution between about 7.0 and 11.5;

b. Contacting said prinited cellulosic material with the de-inking solution until the ink separates from the fibers;

c. Diluting the cellulosic material in the solution by adding water in sufficient amount to reduce the solids content to between about 0.5 to 1.5 percent based upon the solution weight; and

d. Washing the de-inked diluted cellulosic material.

3,932,207

PROCESS FOR OBTAINING CELLULOSE FROM LIGNO-CELLULOSIC RAW MATERIALS

Andre Fogarassy, Paris, France, assignor to Societe de Promotion et d'Exploitation Industrielles de Procedes de Brevets S.A., Geneva, Switzerland

Filed Mar. 5, 1973, Ser. No. 337,858

Claims priority, application Switzerland, Mar. 6, 1972, 3233/72

Int. Cl.² D21C *3/20, 3/26*

U.S. Cl. 162—19 **12 Claims**

1. In a process for obtaining cellulose from ligno-cellulosic raw materials comprising the steps of cooking the raw material in contact with a solution of a reactant for converting lignin present in said raw material into a derivative which is soluble in water or in a water-miscible organic solvent, extracting the thus formed derivative in an aqueous medium, and separating cellulose from the aqueous medium, the improvement which comprises impregnating the raw material, before the cooking step, in the form of fragments, with a solution of said reactant in a solvent which has a boiling point higher than the cooking temperature and which is selected from the group consisting of ethyleneglycol, dipropylengeglycol, glycerol, aniline, diethanolamine and triethanolamine and mixtures of at least one of these substances with water, said reactant being employed in an amount sufficient to solubilize the lignin, whereby the raw material absorbs a portion of the solution, after which the impregnated material is immersed in a liquid which is substantially non-miscible with the solvent of said solution, said liquid having a boiling point higher than the cooking temperature, and which is selected from the group consisting of paraffinic mineral oils, siloxanes, n-butyl acetylricinoleate, n-butyl benzoate, diethyleneglycol monolaurate, propiophenone, dibutylether and mixtures thereof and then maintaining said liquid having the impregnated material immersed therein at the cooking temperature until the lignin has been substantially converted to said derivative.

3,932,208

METHOD OF MAKING SILICATE TREATED ASBESTOS DIAPHRAGMS FOR ELECTROLYTIC CELLS

Franklin Strain, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 343,600, March 21, 1973, Pat. No. 3,847,762. This application May 10, 1974, Ser. No. 468,844

Int. Cl.² D21D *3/00*

U.S. Cl. 162—136 **5 Claims**

1. In a method of preparing an asbestos diaphragm where asbestos is drawn from a cell liquor slurry and deposited onto an electrolyte permeable cathode by drawing a vacuum across the cathode to form an asbestos mat, the improvement comprising coating the deposited asbestos mat with from about 0.01 to 5.0 grams per square foot of mat of a water soluble silicate having the empirical formula $(MeO)_m(SiO_2)_n$ where Me is chosen from the group consisting of lithium, sodium, and potassium, and the ratio of m to n is from about 1:1 to about 1:10, to a depth of at least 0.08 inch into said asbestos mat and contacting said mat with acidic anolyte liquor comprising acidic aqueous sodium chloride to convert said silicate to an amorphous chlor-alkali, anolyte resistant, hydrated silica.

3,932,209

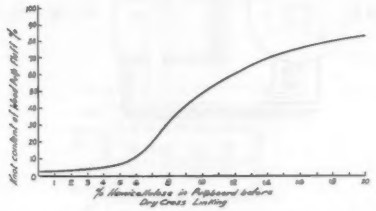
LOW HEMICELLULOSE, DRY CROSSLINKED CELLULOSIC ABSORBENT MATERIALS

Pronoy Kumar Chatterjee, Spotswood, N.J., assignor to Personal Products Company, Milltown, N.J.

Division of Ser. No. 803,525, Feb. 24, 1969, abandoned. This application Aug. 9, 1971, Ser. No. 169,957

Int. Cl.² D21H *5/14*

U.S. Cl. 162—157 C **3 Claims**



1. A method of making pulpboard for grinding into pulp fluff of improved dry and wet resilience and increased fluid absorption and retention capacity from cellulose fibers having a high hemicellulose content comprising:

treating said cellulose fibers to reduce said hemicellulose content to no more than about 7%;

forming a pulpboard from said treated cellulosic fibers; and

dry crosslinking said fibers in said pulpboard form to result in a pulpboard having a knot content of less than 15%.

3,932,210

METHOD OF DISPERSING HYDROXYMETHYL CELLULOSE XANTHATE FIBERS

Migaku Suzuki, Ohtake, and Atushi Kawai, Hiroshima, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed June 18, 1974, Ser. No. 480,389

Claims priority, application Japan, June 18, 1973, 48-68506

Int. Cl.² D21F *11/06;* **D21H** *3/12*

U.S. Cl. 162—157 C **6 Claims**

1. In a method for producing a non-woven fabric or a paper-like material by cutting fibers comprising hydroxymethyl cellulose xanthate, dispersing the cut fibers in an acid aqueous medium and then forming the dispersed fibers into a sheet, the improvement which comprises treating said fibers with a water soluble acid salt of aminoethylethanolamine monostearylamide under acidic conditions so as to impart good self dispersibility to said fibers.

3,932,211

METHOD OF AUTOMATICALLY MONITORING THE POWER DISTRIBUTION OF A NUCLEAR REACTOR EMPLOYING MOVABLE INCORE DETECTORS

James J. Loving, Jr., Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 13, 1973, Ser. No. 379,159

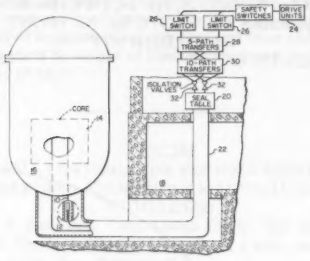
Int. Cl.² G21C *17/00*

U.S. Cl. 176—19 R **11 Claims**

1. A method of on line monitoring the normal power operation of a nuclear reactor using a movable in-core neutron detector comprising the steps of:

automatically inserting and withdrawing the detector respectively into and out of the reactor core region, during normal power operation, at predetermined, staggered, intermittent, time, programmed, sequence intervals;

moving the detector, upon insertion, through the core region along a fixed predetermined path; and



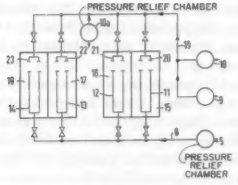
recording the output of the detector as a function of core location.

3,932,212

APPARATUS AND METHOD FOR DEPRESSURIZING, DEGASSING AND AFFORDING DECAY OF THE RADIOACTIVITY OF WEAKLY RADIOACTIVE CONDENSATES IN NUCLEAR POWER PLANTS

Rudolf Gross, and Johann Plotz, both of Mulheim (Ruhr), Germany, assignors to Kraftwerke Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Continuation-in-part of Ser. No. 318,436, Dec. 26, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 450,062
Int. Cl.² G21C *15/00*
U.S. Cl. 176—37 **7 Claims**



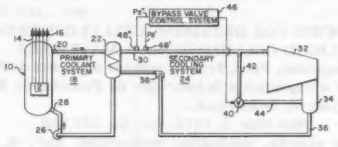
1. Method for depressurizing, degassing and affording decay of weakly radioactive condensates in a steam nuclear power plant of the type having a turbine with higher and lower pressure stages and a main condenser for condensing exhaust steam from the turbine to a main condensate, and at least one feed-water preheater heatable by bleeder steam fed thereto from a higher pressure stage of the turbine, the condensate of said bleeder steam constituting a secondary condensate, which comprises the steps of: feeding the secondary condensaate at a higher temperature and higher pressure than the main condensate into the main condensate so that the secondary condensate vaporizes in the main condensate with simultaneous degassing of the main condensate by the vaporizing of the secondary condensate, and thereafter passing both main and secondary condensates through a flow path of sufficient length to permit the radioactivity to decay.

3,932,213

PERMISSIVE ANALOGUE LOGIC FOR THE STEAM RELIEF VALVES OF A NUCLEAR REACTOR

Charles Ronald Musick, Vernon, and Jose Marcelo Torres, Simsbury, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 2, 1973, Ser. No. 347,023
Int. Cl.² G21D *3/10*
U.S. Cl. 176—60 **6 Claims**



1. A system for the actuation of a plurality of actuable devices whereby the system prevents the actuation of more than one device upon the occurrence of any malfunction including operator error and apparatus failure, the system comprising:

a. first means for generating a first actuation signal;

b. second means parallel to said first means for generating a second actuation signal;

c. means responsive to said first signal for generating a multiplicity of signals for individually actuating said plurality of devices; and

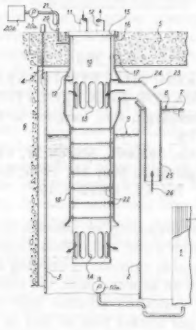
d. a plurality of gate means intermediate said means for generating said first multiplicity of actuation signals and said multiplicity of actuable devices, and responsive to said second signal for selectively passing each individual signal to each device.

3,932,214

NUCLEAR REACTOR

Michel Aubert, Pierrevert; Henri Jacques Gollion, Aix-en-Provence, and Philippe Verriere, Jouques, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed July 19, 1973, Ser. No. 380,678
Claims priority, application France, Aug. 8, 1972, 72.28573
Int. Cl.² G21C *15/00*
U.S. Cl. 176—65 **4 Claims**



1. A nuclear reactor and especially a fast reactor having a core formed by a group of fuel assemblies and cooled by a liquid metal usually consisting of sodium and circulated in contact with said fuel assemblies, said coolant being confined

at least partially within a first primary tank having a vertical axis and containing the reactor core, said primary tank being in turn surrounded by a second main tank, the complete assembly formed by both tanks being placed within a thick-walled structure which constitutes an external containment vessel for providing biological protection against the effects of radioactive radiation, the main tank containing heat exchangers and pumps for removal of heat picked up by the sodium as it passes through the reactor core and circulating said sodium in continuous flow from one tank to the other, each heat exchanger being mounted with a vertical axis, provided with inlet and outlet windows respectively at the upper and lower end for the admission and discharge of sodium derived from the primary tank, and surrounded by an outer shell which penetrates together with said heat exchanger into the region located between the primary tank and the main tank, wherein said shell delimits with the heat exchanger an annular space joined at the level of the heat-exchanger inlet windows to one end of at least one elbowed duct, the other end of which extends into the sodium contained in the primary tank, said annular space being connected by means of a pipe providing a communication with a pumping source for producing a variable negative pressure within said space and thus priming the siphon formed by said primary tank, said elbowed duct and said annular space.

3,932,215
VERTICAL CONTROL ROD FOR RAPID AND SAFE SHUT-OFF OF NUCLEAR REACTORS

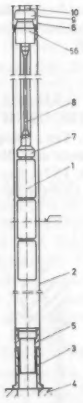
Horst Krüger, Bensberg-Herkenrath, Germany, assignor to Interatom Internationale Atomreaktorbau GmbH, Bensberg, Cologne, Germany

Continuation-in-part of Ser. No. 201,579, Nov. 26, 1971, abandoned. This application Mar. 14, 1973, Ser. No. 341,278

Claims priority, application Germany, Nov. 28, 1970, 2058619

Int. Cl. G21c *7/12*

U.S. Cl. 176—36 R **4 Claims**



1. In a nuclear reactor of the type having an elongated tube for guiding an absorber, a control rod mechanism having raised and lowered positions for rapidly and safely shutting off the nuclear reactor comprising, a flexible absorber guided in said tube for movement between a raised shut-off and a lowered position, a connecting means suspending said absorber within said elongated tube, spring means operatively connected to said connecting means, a drive mechanism connected for compressing said spring means and lowering the absorber release means for releasably holding said spring means in said compressed condition wherein release of said spring means causes the latter to effect accelerating vertical displacement of said connecting means and absorber to the raised position of the absorber and means for disposing said spring means, drive mechanism and release above said elongated tube.

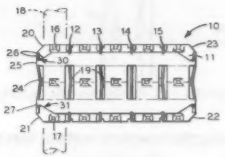
3,932,216
INDUSTRIAL TECHNIQUE

Felix S. Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Continuation of Ser. No. 207,255, Dec. 13, 1971, abandoned. This application Aug. 10, 1973, Ser. No. 387,429

Int. Cl.² G21C *3/18*

U.S. Cl. 176—78 **2 Claims**



1. A cellular grid structure for a fuel element comprising band means of generally uniform width and circumscribing the grid structure, said band means having an inner surface that engages the grid structure and an outer surface, said band means surfaces terminating in at least one generally flat surface, detents on said band means that protrude toward the cellular structure, a plurality of generally parallel flat grid plates each having transverse ends that abut said band means inner surface and having widths that are greater than said band means width, and a further plurality of generally flat grid plates having transverse ends that abut said band means inner surface and having widths that are greater than said band means width, said further plate plurality interlocking with said plurality of plates to form the cellular grid structure, the abutting edges of said interlocking plates having sloping surfaces that match the widths of said plates to the width of said band means, said sloping surfaces extending from said outer surface of said band means and across said generally flat band means surface in order to prevent an adjacent cellular grid structure from locking with said band means and said grid plates, said sloping surface extending toward the cellular structure for a distance that is approximately equal to the inward protrusion of said detents, and said band means further forming a generally rectangular structure circumscribing said interlocking plates and having vee-shaped corner edges formed thereon.

3,932,217
METHOD AND DEVICE FOR THE PASSIVE PROTECTION OF A NUCLEAR REACTOR

Pierre Charles Cachera, Montesson, France, assignor to Electricite de France, Paris, France

Filed Nov. 30, 1973, Ser. No. 420,363

Claims priority, application France, Dec. 20, 1972, 72.45541; Aug. 31, 1973, 73.31540

Int. Cl.² G21C *3/04*

U.S. Cl. 176—83 **10 Claims**

1. A method of passive protection of a nuclear reactor and especially a fast reactor, the steps of replacing at least part of the conventional fuel elements within the core of said reactor by a number of vertical safety fuel elements, forming each safety fuel element with an axial flow duct having a cross-section of large diameter having a ratio with respect to the diameter of the fuel element on the order of 10/15, receiving in said flow duct the portion of fuel which is capable of melting within the central portion of said element under the action of a

neutron-flux excursion and flowing the melted fuel portion under gravity from the mid-height of said element to the base

thereof thus reducing the reactivity without thereby impairing the fuel can.

3,932,218

PRODUCTION OF HETEROPOLYSACCHARIDE BY FERMENTATION OF METHANOL

Robert K. Finn; Alex L. Tannahill, both of Ithaca, N.Y., and Joseph E. Laptewicz, Jr., Groton, Conn., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Division of Ser. No. 364,599, May 29, 1973. This application Nov. 14, 1974, Ser. No. 523,559
Int. Cl.² C12D *13/04*
U.S. Cl. 195—49 2 Claims

1. A method of producing a heteropolysaccharide by fermentation which comprises culturing a microorganism of *Methylomonas mucosa* strain NRRL B-5696 on a culture medium containing methanol as the sole source of assimilable carbon, and recovering the heteropolysaccharide product.

3,932,219

ANTIBIOTIC A-26771 FACTORS AND PROCESS FOR PRODUCTION THEREOF

Karl H. Michel, and Marvin M. Hoehn, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 298,053, Oct. 16, 1972, Pat. No. 3,883,561. This application Jan. 17, 1975, Ser. No. 541,908
Int. Cl.² C12D *9/04*
U.S. Cl. 195—81 4 Claims

1. The method for producing antibiotic A-26771 factors A, B, and C which comprises cultivating *Penicillium turbatum* NRRL 5630 in a culture medium containing assimilable sources of carbohydrate, nitrogen, and inorganic salts until a substantial amount of antibiotic activity is produced by said organism in said culture medium, and separating the A-26771 antibiotic mixtures from said culture medium.

3,932,220

METHOD FOR ISOLATING BACTERIAL COLONIES

Lance A. Liotta, 14004 Mont Ave., East Cleveland, Ohio 44112

Division of Ser. No. 62,810, Aug. 11, 1970, abandoned. This application Jan. 15, 1973, Ser. No. 323,584
Int. Cl.² C12K *1/04*
U.S. Cl. 195—103.5 R 6 Claims

1. A method of isolating bacterial colonies in a sample comprising the steps of:

a. providing a member having a two dimensional surface which can be expanded in at least one dimension;

b. placing a portion of said sample on said surface; and,

c. expanding said surface in said at least one dimension an amount sufficient to cause individual bacterial colonies in said sample to be separated from one another.

3,932,221

IMMUNOLOGICAL ISOZYME DETERMINATION METHOD

Gerhard Pfleiderer, Witten, Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed June 9, 1972, Ser. No. 261,215
Claims priority, application Germany, June 9, 1971, 2128670
Int. Cl.² G01N *31/14*
U.S. Cl. 195—103.5 R 22 Claims

1. A process for the quantitative determination of at least one diagnostically relevant isozyme form of a human enzyme occuring in a plurality of genically defined, immunologically differentiatable multiple isozyme forms, which comprises:

a. quantitatively measuring the total enzyme activity of said multiple isozyme forms in a human body fluid, tissue extract or excretion sample;

b. admixing a portion of said sample with a two to ten fold theoretical excess of a precipitating antibody against a homologous diagnostically relevant human isozyme form, which antibody is specific to said diagnostically relevant human isozyme form and is substantially free of immunological activity against other of said multiple isozyme forms, to produce a substantially quantitative antigen-antibody immunoprecipitin complex consisting essentially of said diagnostically relevant human isozyme form and said antibody;

c. substantially quantitatively separating said immunoprecipitin complex from the resultant admixture so that at least 90% of the diagnostically relevant human isozyme form activity is removed therefrom; and

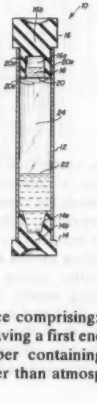
d. quantitatively measuring the total enzyme activity of the remaining multiple isozyme forms substantially free of the diagnostically relevant human isozyme form, whereby the diagnostically relevant human isozyme form can be quantitatively determined.

3,932,222

FOR ISOLATING PATHOGENIC MICROORGANISMS

Gordon L. Dorn, Dallas, Tex., assignor to J. K. & Susie L. Wadley Research Institute and Blood Bank, Dallas, Tex.

Filed Dec. 20, 1974, Ser. No. 535,148
Int. Cl.² C12K *1/04*
U.S. Cl. 195—127 24 Claims



1. A fluid mixing device comprising:

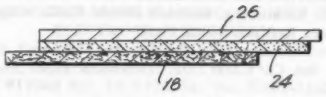
a. an enclosed vessel having a first end and a second end and comprising a chamber containing an evacuated space maintained at a lower than atmospheric pressure;

b. an injectable closure means sealably closing said first end of said enclosed vessel;
c. an enclosed treating fluid chamber disposed in communication with said injectable closure means and separated from said evacuated chamber by an elastomeric film which will rupture when pierced by a needle; and
d. a treating fluid disposed within said treating fluid chamber.

3,932,223
CULTURING MEDIUM

Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741

Division of Ser. No. 405,939, Oct. 12, 1973, Pat. No. 3,864,213. This application Jan. 7, 1975, Ser. No. 539,254
Int. Cl.² C12K *1/10*
U.S. Cl. 195—139 **9 Claims**



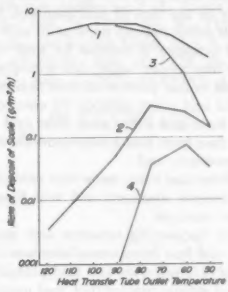
1. In an article for testing the presence of predetermined microorganisms, a wick having one part adapted to be placed in engagement with a body fluid and an opposed part distant from said one part, a culture medium for encouraging the growth of predetermined microorganisms, said culture medium engaging the wick and extending from the region of said one part thereof toward said opposed part thereof, and means enclosing at least part of the wick and culture medium for exposing said one part of said wick so that said one part can be placed in engagement with a body fluid and for limiting the distribution of the body fluid along said wick from said one part toward said opposed part thereof in a manner providing a degree of saturation of the body fluid in the wick which is gradually reduced from said one part toward said opposed part of the wick to provide a density gradient of the body fluid extending from said one part toward said opposed part of the wick.

3,932,224
METHOD OF PREVENTING SCALE FROM BEING DEPOSITED IN CASE OF PRODUCING FRESH WATER FROM SEA WATER

Kunio Hirota, Hitachi; Yoshinori Takata, Tokai; Yoshijiro Arikawa, Hitachi; Kazuo Tanno, Hitachi, and Yoshiaki Okajima, Hitachi, all of Japan, assignors to Keishin Matsumoto Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 442,670, Feb. 14, 1974, abandoned. This application Dec. 16, 1974, Ser. No. 532,814
Claims priority, application Japan, Feb. 22, 1973, 48-20628
Int. Cl.² B01D *1/26;* C23F *11/00*
U.S. Cl. 203—7 **6 Claims**

1. A method of preventing scale from being deposited in case of producing fresh water from sea water by heating the sea water at a temperature not higher than 120°C to obtain a concentration ratio of not larger than 2 and by condensing water vapour evolved to obtain the fresh water, comprising adding to the sea water 0.1 to 10% by weight of at least one seed crystal selected from the group consisting of magnesium hydroxide and calcium carbonate and 1 to 100 ppm of at least one surface active agent selected from the group consisting of alkyldimethylbenzyl ammonium chloride, alkenyldimethylbenzyl ammonium chloride, acyldimethylbenzyl ammonium chloride, polyoxyethylenealkylamine, polyoxyethylenealkenylamine, and polyoxyethylenacylamine, the carbon number

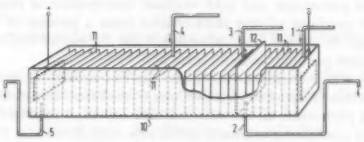


of the alkyl group, alkenyl group and acyl group being 10 to 20.

3,932,225
PROCESS FOR SEPARATELY RECOVERING URANIUM, TRANSURANIUM ELEMENTS, AND FISSION PRODUCTS OF URANIUM FROM ATOMIC REACTOR FUEL

Abdel-Lativ Bilal; Klaus Metscher; Bernhard Muhlig; Christoph Reichmuth; Bernd Schwarz, and Karl-Erik Zimen, all of Berlin, Germany, assignors to Hahn-Meitner-Institut fur Kernforschung Berlin GmbH, Berlin, Germany

Filed Nov. 3, 1972, Ser. No. 303,377
Claims priority, application Germany, Nov. 3, 1971, 2154655
Int. Cl.² C01G *56/00*
U.S. Cl. 204—1.5 **8 Claims**



1. A process for separately recovering uranium, plutonium, transplutonium elements, and fission products of said uranium and plutonium from an aqueous solution of atomic reactor fuel, said uranium and said plutonium constituting the major components of said fuel in said solution, and said transplutonium elements and fission products constituting minor constituents, which comprises:
a. subjecting said solution to electrolysis in a zone between an anode and a cathode in the presence of a complexing agent capable of forming an electrically neutral complex with said plutonium while an aqueous carrier liquid is caused to flow through said zone in a direction from said cathode toward said anode at a rate sufficient so that said complex is carried by said carrier liquid toward said anode, while cations of said uranium, said transplutonium elements and at least a major portion of said fission products migrate toward said cathode;
b. withdrawing said plutonium free from said uranium, said transplutonium elements, and said major portion of said fission products from said zone near said anode;
c. withdrawing from said zone near said cathode a liquid fraction free from plutonium and containing said uranium, said transplutonium elements, and said major portion of said fission products;
d. subjecting said liquid fraction to electrolysis in another zone between another anode and another cathode while

an aqueous carrier liquid is caused to flow through said other zone at a rate satisfying the relationship

$$Eu_U < v < Eu'$$

wherein E is the local field strength in said other zone, u_U is the mobility of the ions of said uranium, and u' is the mobility of all other cations present in said other zone, whereby said uranium is carried by said carrier liquid toward said other anode while said transplutonium elements and said major portion of said fission products is carried toward said other cathode by electrolysis;

e. withdrawing from said other zone near said other anode said uranium free from said transplutonium elements and said fission products; and

f. withdrawing from said other zone near said other cathode said transplutonium elements and said fission products free from said uranium.

3. A process for recovering uranium and plutonium free from one another and free from transplutonium elements and fission products of said uranium and said plutonium from an aqueous solution of atomic reactor fuel, said uranium and said plutonium constituting the major components of said fuel in said solution, and said transplutonium elements and fission products constituting minor constituents, which process comprises:

a. subjecting said solution to electrolysis in a zone between an anode and a cathode spaced from said anode in the presence of a complexing agent capable of forming an electrically neutral complex with said plutonium while an aqueous carrier liquid is caused to flow through said zone transverse to the direction of spacing of said cathode and of said anode at a rate sufficient so that said complex is carried by said carrier liquid across said zone substantially without migrating toward said cathode or said anode, while cations of said uranium, said transplutonium elements and at least a major portion of said fission products migrate toward said cathode, the rate of migration of the cations of said uranium being substantially smaller than that of the cations of said transplutonium elements and of the fission products of said major portion, whereby said plutonium and said uranium accumulate in respective portions of said zone spaced from a portion of said zone in which said transplutonium elements and said fission products accumulate; and

b. separately withdrawing three liquid fractions from said portions respectively, a first one of said fractions containing plutonium as the sole metallic solute, a second fraction containing uranium as the sole metallic solute, and a third fraction being free from uranium and plutonium and containing said transplutonium elements and said major portion of fission products.

3,932,226

METHOD OF ELECTRICALLY INTERCONNECTING SEMICONDUCTOR ELEMENTS

Jerome Barnard Klatskin, Princeton Junction, and Arye Rosen, Cherry Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 6, 1974, Ser. No. 530,401
Int. Cl.² C25D 5/02
U.S. Cl. 204—16 **10 Claims**

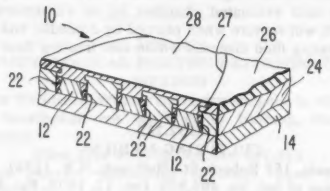
1. A method of electrically interconnecting a plurality of spaced semiconductor elements adjacent to a substrate, each element having a mesa shape with a top surface spaced apart from said substrate and a side surface, comprising the steps of:

coating the side surface of said elements with a protective material,

filling in the space above said substrate and in between said elements with a temporary support material,

depositing a continuous electrically-conductive layer on said support material and in electrical contact with the top surfaces of a plurality of said elements, and

removing said temporary support material, whereby said electrically-conductive layer forms a homogeneous air-



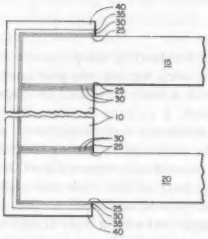
bridge electrically interconnecting a plurality of said elements.

3,932,227

ELECTROFORMED HERMETIC GLASS-METAL SEAL

Howard S. Rothenberg, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Nov. 18, 1974, Ser. No. 524,435
Int. Cl.² C25D 5/02, 5/10; B23K 31/02
U.S. Cl. 204—16 **19 Claims**



1. The method of joining a first structure, comprising a glass-like substance, to a second structure, comprising a substance selected from the group consisting of glass-like and metallic substances, comprising the following steps, each of which is performed at or near ambient temperature:

a. applying, to at least a portion of the mating surfaces of said first and second structures, a coating comprising a metallic substance capable of forming an intermolecular bond therewith;

b. covering at least a portion of said coating on each of said mating surfaces with a layer of a noble metal;

c. placing said first and second structures in juxtaposition with at least portions of their mating surfaces in contact;

d. placing a continuous overlayer of a noble metal over portions of said first and second structure, at least some of said overlayer in contact with said layers of noble metal; and

e. electrodepositing a cap over at least a portion of said overlayer, said cap comprising a metal having the property of exerting a compressive force when deposited.

3,932,228

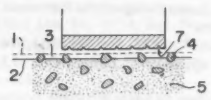
METAL MATERIAL FOR SLIDING SURFACES

Masashi Sugiyama, and Takumi Kunikiyo, both of Hamamatsu, Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Oct. 29, 1974, Ser. No. 518,508
Claims priority, application Japan, Nov. 1, 1973, 48-123205
Int. Cl.² C25D 7/04, 5/02
U.S. Cl. 204—26 **4 Claims**

1. In combination, a first member containing a surface of porous hard chromium, and a second member containing a

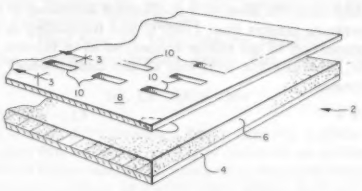
composite electroplated surface wherein silicon carbide particles project outwardly beyond a nickel matrix, said surface of porous hard chromium and said composite electroplated surface being in sliding engagement, whereby lubricant may be retained both by said porous hard chromium and on said composite electroplated surface between said projecting silicon carbide particles.



3,932,229
METHOD OF SAMPLE APPLICATION TO GEL ELECTROPHORESIS MEDIA

Joseph D. Grandine, Acton, Mass., assignor to Millipore Corporation, Bedford, Mass.

Filed Nov. 15, 1974, Ser. No. 524,040
Int. Cl.² B01K *5/00*
U.S. Cl. 204—180 G **5 Claims**



1. The method of applying a sample liquid to a gel electrophoresis medium which comprises in combination the steps of:
a. placing a cover sheet in contact with the surface of such gel medium, said sheet having a slit formed therein at the desired sample location;
b. placing an amount of sample in excess of that to be absorbed by said medium over said slit,
c. beginning measurement of a predetermined time when said excess sample is in place over said slit;
d. blotting the unabsorbed sample from said slit at the end of the measurement of said predetermined time, whereby said excess sample is in place over said slit for a fixed and determined period; and
e. removing said cover sheet from contact with the surface of said gel medium

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3,932,230
METHOD OF EXTRACTING GALLIUM

Steven William Summers, Hazlemere, England, assignor to The British Aluminium Company Limited, London, England

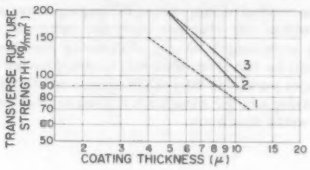
Filed July 19, 1974, Ser. No. 490,031
Claims priority, application United Kingdom, July 19, 1973, 34480/73
Int. Cl.² C25C *1/22*; **C22B** *25/08*
U.S. Cl. 204—105 R **8 Claims**

1. A method of removing gallium from a metal selected from the group consisting of tin, lead, and tin-lead alloy which comprises treating the metal in molten form with a molten flux consisting essentially of alkali metal hydroxide, and removing the flux containing gallium from the remainder of the metal.

3,932,231
METHOD OF MAKING SURFACE-COATED CEMENTED CARBIDE ARTICLES

Akio Hara, and Shuji Yazu, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 26, 1971, Ser. No. 119,134
Claims priority, application Japan, Mar. 5, 1970, 45-18285; Apr. 4, 1970, 45-28739; Apr. 18, 1970, 45-33172; Apr. 18, 1970, 45-33173; Aug. 7, 1970, 45-69583; Aug. 7, 1970, 45-69584
Int. Cl.² C25D *13/02*
U.S. Cl. 204—181 **10 Claims**

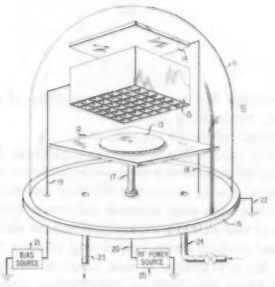


1. A method of making surface-coated cemented carbide articles, which comprises providing a 3–50% by weight dispersion of fine powders of 20 microns or less containing 50% or more of titanium carbide in a liquid consisting mainly of an organic solvent, immersing a tungsten carbide base cemented carbide article containing 4–30% of a binder metal in the dispersion, applying a direct current voltage of 10–500 volts to the surface of the tungsten carbide base cemented carbide article to cause electrophoretic deposition of the fine powders of the dispersion thereon, heating the coated surface at a temperature of 1260°–1550°C in a vacuum or in a reducing or inert atmosphere and thereby forming a coating layer on the surface consisting mainly of titanium carbide of 100 microns or less on the surface of the cemented carbides.

3,932,232
SUPPRESSION OF X-RAY RADIATION DURING SPUTTER-ETCHING

Edward Franklin Labuda, Allentown, and William Dennis Ryden, Whitehall, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 29, 1974, Ser. No. 528,038
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 **10 Claims**



1. A sputter-etching system for removing material from a workpiece which includes,
1. an evacuable chamber adapted to contain a reduced pressure ionizable gas atmosphere therein,
2. a cathode and an anode in said chamber, said cathode having means for mounting said workpiece in association therewith,

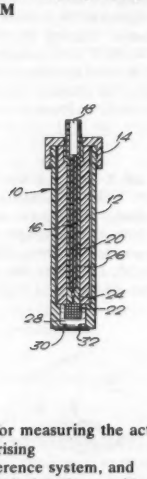
3. voltage means for applying a potential between said cathode and anode for producing a glow discharge therebetween,
4. characterized in that an X-ray attenuating member is interposed between said anode and cathode and in juxtaposition to said anode, said attenuating member comprising a plurality of passages defined by thin walls generally parallel to the direct path between said cathode and anode, said passages having a length dimension large in comparison to their maximum width dimension.

7. In a process for sputter-etching an electronic element by the formation of a glow discharge region between a pair of electrodes in a reduced pressure chamber containing an ionized gas, the method of suppressing the impingement of X-rays produced within said chamber upon the electronic element comprising mounting an X-ray attenuating member in the path between the two electrodes, said member having a plurality of passages parallel to the path between said electrodes, the passages having a length dimension at least several times their maximum width dimension.

3,932,233
CALCIUM ELECTRODE AND MEMBRANE AND COMPOSITION FOR USE THEREIN

Jaromir Ruzicka, Naerum, and Jens Christian Tjell, Virum, both of Denmark, assignors to Radiometer A/S, Denmark

Filed Sept. 28, 1973, Ser. No. 401,809
Claims priority, application United Kingdom, Oct. 2, 1972, 45291/72
Int. Cl.² G01N *27/30, 27/46;* C25B *13/08*
U.S. Cl. 204—195 M **16 Claims**



1. An electrode for measuring the activity of calcium ions in a solution, comprising
1. an internal reference system, and
2. a calcium di(aryl)phosphate, said calcium di(aryl)phosphate being positioned in the electrode so as to be contactable with said measured solution and to be in electrical contact with said internal reference system, the aryl groups of said calcium di(aryl)phosphate each carrying at least one carbon chain containing at least three carbon atoms, the aryl groups of said calcium di(aryl)phosphate further carry electrophilic substitution, and the electrophilic substitution is nitro or halogen substitution.

2. An electrode for measuring the activity of calcium ions in a solution, comprising:
a. an internal reference system, and
b. calcium di(p-n-octylphenyl)phosphate, said calcium di(p-n-octylphenyl)phosphate being positioned in the electrode so as to be contactable with said measured solution and to be in electrical contact with said internal reference system.

3,932,234
METHOD FOR MANUFACTURING SINGLE-ORIENTED ELECTRICAL STEEL SHEETS COMPRISING ANTIMONY AND HAVING A HIGH MAGNETIC INDUCTION

Takuichi Imanaka; Takahiro Kan; Yoshio Obata, and Toru Sato, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Oct. 9, 1973, Ser. No. 404,776
Claims priority, application Japan, Oct. 13, 1972, 47-101850
Int. Cl.² H01F *1/04*
U.S. Cl. 148—112 **7 Claims**

1. A method of manufacturing single-oriented electrical steel sheet comprising:
a. hot rolling a silicon steel raw material consisting essentially of less than 0.06% of carbon, less than 4% of silicon, 0.012 to 0.045% of antimony aand 0.008 to 0.10% of at least one member of a group selected from selenium, sulphur and tellurium, and 0.02 to 0.2% of manganese, to an intermediate gauge of about 2–5mm;
b. effecting at least one cold rolling at a reduction rate of 40–85% so as to form a cold rolled steel sheet having final gauge;
c. decarburization annealing said sheet in a wet hydrogen atmosphere at 750°–850°C to minimize the amount of carbon in said sheet subsequently;
d. subjecting the sheet to a secondary recrystallization annealing at a temperature of 800°–920°C for 10 to 120 hours selected so as to grow the crystal grains having (110) (001) orientation; and thereafter;
e. subjecting the sheet to a purification annealing at a temperature greater than 1,000°C and fluctuating in direct proportion to the silicon content so as to remove S and Se, whereby the iron loss of the final product is decreased.

3,932,235
METHOD OF IMPROVING THE CORE-LOSS CHARACTERISTICS OF CUBE-ON-EDGE ORIENTED SILICON-IRON

Karl Foster, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 382,267, July 24, 1973, abandoned. This application May 7, 1974, Ser. No. 467,696
Int. Cl.² H01F *1/04*
U.S. Cl. 148—113 **11 Claims**

1. In the method of improving the core loss characteristics at high operating inductions of iron-silicon alloy members which are to be subjected to a final heat treatment for developing a "cube-on-edge" or (110) [001] orientation, the steps comprising, cleaning the surface of the alloy member to remove all oxides and other foreign matter therefrom which alloy member is in the cold rolled finish thickness condition, applying a coating to at least one side of the alloy member which coating comprises alumina in the form of a powder having an average particle size of about 300 mesh and in no event greater than 100 mesh, is non-reactive with the alloy and which promotes decarburization, heating the coated alloy to a temperature within the range between about 1,075°C and 1,300°C for a time period of between about 6 hours and about 36 hours, while maintaining a dry hydrogen atmosphere about said alloy.

3,932,236

METHOD FOR PRODUCING A SUPER LOW WATT LOSS GRAIN ORIENTED ELECTRICAL STEEL SHEET

Toshiya Wada, Kitakyushu; Tadao Nozawa, Munakata, and Toshihiko Takata, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Japan

Filed Jan. 18, 1974, Ser. No. 434,449
Claims priority, application Japan, Jan. 22, 1973, 48-8704
Int. Cl.² H01F *1/04*
U.S. Cl. 148—113 2 Claims

1. In a method for producing a grain-oriented electrical steel sheet having super low watt loss wherein a silicon steel sheet ingot or slab containing 2.5 to 4.0% Si is subjected to hot rolling, annealing and at least one cold rolling to a final thickness, and the steel is subjected to decarburization annealing and a finishing annealing to complete the secondary recrystallization, and the surface of the steel is then cleaned, the improvement which comprises after said surface cleaning step, polishing the surface of the steel to a mirror finish by electrolytic or chemical polishing and applying a thin metal plating to the polished surface.

3,932,237

METHOD FOR FORMING AN INSULATING GLASS FILM ON SURFACES OF AN ORIENTED SILICON STEEL SHEET

Toshio Irie, Kobe; Yasuo Yokoyama; Yoshihiko Kameishi, both of Ashiya; Katsuo Yamaguchi, Takarazuka, and Kazuo Hamachi, Nishinomiya, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Sept. 19, 1974, Ser. No. 507,277
Claims priority, application Japan, Oct. 30, 1973, 48-121174
Int. Cl.² H01F *1/04*
U.S. Cl. 148—113 4 Claims

1. In a method for forming a highly adhesive uniform insulating glass film consisting mainly of forsterite on surfaces of an oriented silicon steel sheet, comprising sequential steps of:

a. cleaning surfaces of a cold rolled silicon steel strip said cleaning including a degreasing step and said steel strip having a final gauge and containing 2–4% of silicon;

b. subjecting the cleaned steel strip to a decarburizing annealing at a temperature of 700°–900°C under a wet hydrogen atmosphere to form SiO_2-containing oxide film on the surfaces of the steel strip; and

c. applying to the decarburized steel strip an annealing separator consisting mainly of magnesia, winding the steel strip in the form of a coil, and subjecting the coiled steel strip to a final annealing at a temperature of 1100°–1300°C under a hydrogen-containing atmosphere,

the improvement comprising pickling the cold rolled silicon steel strip following the degreasing part of the cleaning step and prior to the decarburizing annealing such that the surface layers of the steel strip are removed in an amount of at least 3g/m².

3,932,238

METHOD AND APPARATUS FOR QUENCHING PIPE

Franklin C. Safford, Philadelphia, Pa., assignor to Drever Company, Huntingdon Valley, Pa.

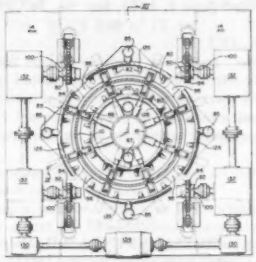
Filed Jan. 24, 1975, Ser. No. 543,778
Int. Cl.² C21D *1/62*
U.S. Cl. 148—131 12 Claims

1. An apparatus for vertically quenching a hot metal pipe comprising:

a. a first means shaping the hot pipe into a round configuration and restraining the pipe in the round configuration;

b. a second means applying high intensity curtains of quench fluid to the inside surface of the pipe and to the outside surface of the pipe, the quench curtains impinge the inner and outer surfaces in the form of rings; and

c. a third means supporting the pipe and continuously moving it to and through the first means then through the second means in a substantially vertical path in the direction of the longitudinal axis of the pipe.

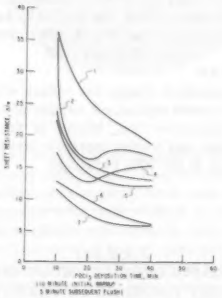


3,932,239

SEMICONDUCTOR DIFFUSION PROCESS

William A. Brown, Wappingers Falls, N.Y., assignor to Cogar Corporation, Utica, N.Y.

Filed Oct. 27, 1970, Ser. No. 84,276
Int. Cl.² H01L *21/225*
U.S. Cl. 148—186 54 Claims



1. A method for controlling the junction depth of a diffused semiconductor region having a certain sheet resistance and a PN junction located within a silicon substrate comprising the step of:

reoxidizing the silicon substrate surface for a period of time and at a temperature sufficient to reduce the junction depth of said diffused semiconductor region to a desired level.

3,932,240

BURNING RATE MODIFYING BINDER FOR PROPELLANT AND METHOD

John D. Braun; Arnold Nielsen; M. Frank Pickett; Ronald Henry, all of China Lake, and William P. Norris, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 4, 1973, Ser. No. 367,091
Int. Cl.[2] C06B 45/10
U.S. Cl. 149—19.2 4 Claims

1. A binder - burn rate modifier system for solid rocket propellants comprising hydroxy terminated polybutadiene with a suitable curative as the binder and a member selected from the group consisting of 4,4-diferrocenyl-1-pentanol and 3,3-diferrocenylbutyl isocyanate as the burn-rate modifier.

3,932,241

PROPELLANTS BASED ON BIS[N-(TRINITROETHYL)NITRAMINO]ETHANE

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 6, 1970, Ser. No. 56,017
Int. Cl.[2] C06D 5/06
U.S. Cl. 149—19.3 10 Claims

1. A propellant composition comprising; an oxidizer including bis[N-(trinitroethyl)nitramino]ethane, an acrylate-acrylic acid binder, and a curing agent, said acrylate-acrylic acid being present in a ratio of acrylate to acrylic acid in an amount of about 90/10 to about 96/4.

3,932,242

SOLID PROPELLANT WITH BUTYL RUBBER BINDER

Charles E. Bartley, 6520 E. Exeter Blvd., Scottsdale, Ariz. 85251, and Lawrence R. Settlemire, 2489 Ocean St., Carlsbad, Calif. 92008

Continuation-in-part of Ser. No. 697,789, Nov. 21, 1957, abandoned, which is a continuation-in-part of Ser. No. 355,148, May 14, 1953, abandoned, and a continuation-in-part of Ser. No. 692,147, Aug. 21, 1946, abandoned. This application May 8, 1961, Ser. No. 108,672
Int. Cl. C06d 5/06
U.S. Cl. 149—19.9 6 Claims

1. A solid propellant charge for rocket motors consisting essentially of a formed vulcanized mixture of rubbery isobutylene-isoprene copolymer fuel binder in the proportion of 10–20% by weight and a solid inorganic strong oxidizing salt in the proportion of 80–90% by weight.

3,932,243

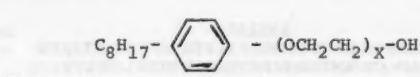
CLEANING AND POLISHING COMPOUND FOR BARREL AND VIBRATORY FINISHING OF FERROUS AND NON-ERROUS METALS

Edward H. Chang, and Oliver D. Nichols, both of Burnsville, Minn., assignors to Fremont Industries, Inc., Shakopee, Minn.

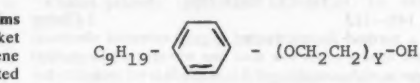
Continuation-in-part of Ser. No. 381,359, July 20, 1973, abandoned. This application Dec. 18, 1974, Ser. No. 533,938
Int. Cl.[2] C23G 1/36
U.S. Cl. 156—20 7 Claims

1. The method of polishing the surface of a metal article which includes immersing and agitating the article in an aqueous solution comprising:

a. the reaction product obtained from the reactant mixture of an alkylphenol selected from the group consisting of an octylphenol having the structural formula:



wherein X represents an integer having an average value of from between about 1 and 30; and a nonylphenol having the structural formula:



wherein Y represents an integer having an average value of from between about 5 and 13; and phosphoric acid based upon P_2O_5 in a molar ratio of between 1:3 and up to 3:4 of P_2O_5 to alkylphenol.

3,932,244

PRODUCTION OF CARBON LINING FOR REDUCTION CELLS

Anfinnur Mikkelsen, Kitimat, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Dec. 19, 1973, Ser. No. 426,136
Int. Cl.[2] C08L 71/06, 95/00; C25B 11/12; C25C 3/06
U.S. Cl. 156—71 14 Claims

1. A method of making lining bodies for aluminum reduction cells, comprising adding binder material comprising an alkaline-catalyzable furan binder to a carbonaceous aggregate comprising carbon material recovered from used, chemical-containing carbon lining of an aluminum reduction cell, said carbon material containing residual contaminant material from the used lining, for reacting said furan binder with said residual contaminant material acting as catalyst to produce a hardened carbon body, said binder material being added in a proportion equal to between about 11% and about 14% of the total weight of the aggregate and the binder, and consisting essentially of furan binder and pitch respectively present in relative proportions, by weight, between about 65:35 and about 50:50, said furan binder consisting essentially of furan binder constituents that react in the presence of an alkaline catalyst to form a resin that, in mixture with an aggregate, acts as a binder providing a hardened body, said furan binder being selected from the class consisting of a furfural plus a phenol, furfural plus a ketone, and furfuryl alcohol plus an aldehyde plus an amine, and said pitch being a high melting point pitch.

4. A method of lining an aluminum reduction cell, comprising

a. intimately mixing a minor proportion of binder material including an alkaline-catalyzable furan binder with a major proportion of a carbonaceous aggregate comprising carbon material recovered from used, chemical-containing carbon lining of an aluminum reduction cell, said carbon material containing residual contaminant material from the used lining, for reacting said furan binder with said residual contaminant material acting as catalyst; and

b. disposing a body of the mixed aggregate and binder in an aluminum reduction cell as a lining therefor;

c. said binder material being added in a proportion equal to between about 11% and about 14% of the total weight of the aggregate and the binder, and consisting essentially of furan binder and a high melting point pitch respectively present in relative proportions, by weight, between about 65:35 and about 50:50, said furan binder being selected from the class consisting of furfural plus a phenol, furfural plus a ketone, and furfuryl alcohol plus an aldehyde plus an amine.

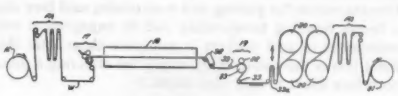
3,932,245
MECHANICAL EMBOSSING OF FOAMED SHEET MATERIAL

Edward R. Erb, East Greenville, and Richard L. Maass, Emmaus, both of Pa., assignors to GAF Corporation, New York, N.Y.

Division of Ser. No. 78,878, Oct. 7, 1970, Pat. No. 3,741,851, which is a continuation-in-part of Ser. No. 821,409, May 2, 1969, Pat. No. 3,655,312. This application Mar. 21, 1973, Ser. No. 343,399

Int. Cl.² B32B *5/20, 31/20*

U.S. Cl. 156—79 **11 Claims**



1. A process for producing sheet material comprising a layer of cellular or foamed resin material having a mechanically embossed relief pattern in a surface thereof and being of substantially uniform composition in both the land and valley areas of the relief pattern, and a color pattern on said surface with areas of said color pattern in registry with pattern areas of the relief pattern, comprising the steps of:

1. forming a layer of foamable resin material,
2. heating to gel said layer of foamable resin material,
3. applying a color pattern to the upper surface of the layer of gelled foamable resin material,
4. applying a layer of substantially transparent resin material of substantially uniform thickness over said upper surface and color pattern,
5. heating said layers at a sufficient temperature to foam said foamable resin material and fuse the resin material in both said layers, and
6. drawing the sheet material containing such foamed and fused resin material while said layer of foamed resin material is hot through the nip between a backing roll contacting the undersurface of said sheet material and an embossing roll contacting the upper surface of the sheet material, said backing and embossing rolls being driven by contact with said sheet material, the embossing being effected at constant roll pressure to thereby control the pressure of engagement of the sheet material in the nip between said embossing and backing rolls, said pressure and the rotational speed of said embossing roll being controlled to apply to the surface of the layer of foamed resin material bearing the color pattern a relief pattern while maintaining the uniformity of the thickness of said layer of substantially transparent resin material, areas of which relief pattern are in registry with areas of said color pattern.

3,932,246
GAS SENSOR AND METHOD OF MANUFACTURE

Henry L. Stadler; Tseng-Ying Tien, both of Ann Arbor; Michael J. Esper, Detroit, and Donald J. Romine, Southfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 393,698, Aug. 31, 1973, Pat. No. 3,886,785, which is a continuation-in-part of Ser. No. 198,515, Nov. 15, 1971, abandoned. This application Sept. 5, 1974, Ser. No. 503,590

Int. Cl.² C04B *39/12*

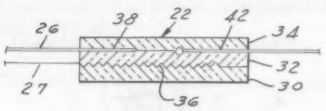
U.S. Cl. 156—89 **6 Claims**

1. A method of manufacturing a porous ceramic gas sensor comprising the steps of:

forming a fine powder from a transition metal oxide, said powder being at least 99% pure;

forming a slurry of said powder and an organic binder solution, the organic binder solution being capable of drying such that the binder will comprise less than about 20%, by weight, of the dried slurry;

drying the slurry in a sheet so that the organic binder constituent is less than about 20% by weight of the dried slurry;



cutting the sheet to provide a plurality of complementarily sized green ceramic wafers;

sandwiching a pair of electrodes in spaced-apart relation between a first pair of said green ceramic wafers; and

maturing the sandwiched green ceramic laminae to a density of from about 72 to about 85% of theoretical density.

3,932,247
METHOD OF MAKING THERMOPLASTIC RESIN MATTINGS

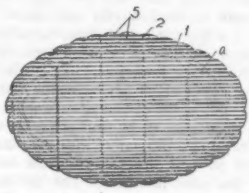
Yasuhiro Oshima, c/o Meiwa Gravure Chemical Co., Ltd. 860, Kashida, Higashi Osaka, Osaka, Japan

Continuation of Ser. No. 88,693, Nov. 12, 1970, abandoned. This application Mar. 20, 1973, Ser. No. 342,933

Claims priority, application Japan, Sept. 25, 1970, 45-95593

Int. Cl.² B32B *27/12, 31/18, 5/02;* **D03D** *25/00*

U.S. Cl. 156—148 **5 Claims**



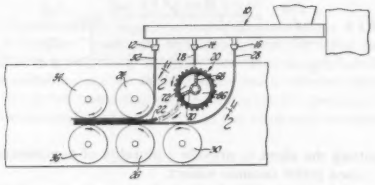
1. A method of producing thermoplastic resin mattings with contoured surfaces comprising a base material consisting of a plurality of resilient thermoplastic resin rods in closely spaced parallel relationship with each other in a single layer and a plurality of thermoplastic resin threads extending transversely of said rods and disposed at spaced intervals along the length of said rods, and a transparent synthetic thermoplastic resin sheet, said method comprising interweaving said thermoplastic resin threads with said thermoplastic resin rods so that the thermoplastic resin threads completely encircle the thermoplastic resin rods at their points of contact and thereby form said base material, superimposing said transparent synthetic thermoplastic resin sheet on said base material, applying heat and pressure at specific corresponding points on said base material and said transparent synthetic thermoplastic resin sheet for thermally adhering them together, said step of applying heat and pressure comprising forming contoured surfaces at said specific points so as to create an ornamental design thereon, and cutting those portions of the base material and thermoplastic resin sheet extending a specific distance outwardly from said specific points so as to form the outer edge of said mattings.

3,932,248

METHOD AND APPARATUS FOR MAKING LAMINATED BOARD WITH A POCKETED CORE

Clyde D. Keaton, 48 Dickinson St., Woodstown, N.J. 08098

Filed Sept. 28, 1973, Ser. No. 401,737
Int. Cl.[2] B31F *1/20*
U.S. Cl. 156—210 12 Claims



tion temperature, said forming elements being disposed in an array in which concave and convex elements occur alternately with lines of convex elements extending across lines of concave elements, whereby said sheet is formed with multiple oppositely opening pockets with substantially flat portions of said sheet between adjacent pockets, means adjacent the roll-forming means for changing the direction of advance of said sheet away from the roll-forming means to remove the sheet from said forming elements, second and third extruder means disposed relative to said first extruder means for extruding a pair of face sheets of thermoplastic resin on opposite sides of said core sheet, and means on opposite sides of said face sheets and located at a position downstream of the roll-forming means for guiding and maintaining said face sheets at a fusion bonding temperature and in engagement with the extremities of said pockets in said core sheet after the core sheet leaves the roll-forming means for effecting a joinder of each face sheet to said core sheet.

1. The method of making a laminated board with a pocketed core comprising the steps of extruding a core sheet of thermoplastic resin at a temperature higher than the melting point thereof, feeding said core sheet through roll-forming means while it is above its plastic deformation temperature deforming portions of said core sheet by vacuum-drawing said core sheet against multiple convex forming elements protruding outwardly from cylindrical reference surface of the roll-forming means and disposed in parallel rows extending in one direction and against multiple concave forming elements receding inwardly of the cylindrical reference surface and disposed in parallel rows in a transverse direction and against said cylindrical reference surface, said forming elements being spaced apart by portions of said cylindrical reference surface, to form multiple pockets with rows of inverted pockets extending across rows of noninverted pockets with substantially flat and relatively non-deformed portions of said sheet between adjacent pockets, maintaining said forming elements at a temperature lower than said core sheet, rotating said roll-forming means to remove said core sheet therefrom after carrying it less than one revolution, extruding a pair of face sheets of thermoplastic resin at a temperature higher than the melting point thereof, joining said face sheets to the deformed core sheet by continuously advancing the extruded face sheets on opposite sides of the deformed core sheet at the same rate as the deformed core sheet, and engaging and bonding the inner surface of one face sheet with the outer extremities of the inverted pockets and engaging and bonding the inner surface of the other face sheet with the extremities of the noninverted pockets, said joining being effected after said core sheet is removed from the roll-forming means and by maintaining said face sheets at sufficiently high temperature to effect fusion of the extremities of the said pockets with said face sheets.

5. Apparatus for making a laminated board with a pocketed core comprising first extruder means for extruding a thermoplastic resin in the form of a sheet at a temperature higher than the melting point of said resin, roll-forming means adjacent said first extruder means and including a rotatable roll having a cylindrical surface portion and having multiple forming elements disposed thereon, said rotatable roll being adapted to receive said sheet and carry it in a downstream direction through less than one revolution of the roll, means for maintaining said forming elements at a temperature lower than said sheet, said multiple forming elements including a first group of elements which are convex relative to the cylindrical surface portion of said roll and including a second group of elements which are concave relative to said cylindrical surface portion, each of said forming elements being separated from adjacent forming elements by a part of said cylindrical surface portion, means for applying a partial vacuum to the region between the sheet and the surface of the roll for urging said sheet toward said roll into engagement with said convex and concave forming elements and with said cylindrical surface portion while the sheet is above its plastic deforma-

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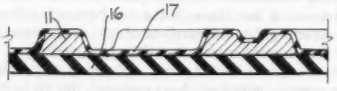
3,932,249

MESH REINFORCED ELASTOMERIC POLYMERS

Harold Rex Jury, Norwood, and John Henry Hay, Panorama, both of Australia, assignors to Comalco (J. & S.) Pty. Limited, Victoria, Australia

Filed Apr. 10, 1974, Ser. No. 459,670
Claims priority, application Australia, Apr. 13, 1973, 2979/73
Int. Cl.[2] B29C *24/00*
U.S. Cl. 156—213 10 Claims



1. A method of forming a reinforced elastomeric polymer comprising forming a reinforcing metal grid to have longitudinally extending members and joining members joining the longitudinally extending members, the surfaces of the joining members being displaced from the common tangential planes of the surfaces of adjacent said longitudinally extending members,

rendering one face of each of two sheets of elastomeric material adhesive, the length and width of each of said sheets exceeding respectively the length and width of the reinforcing grid,

interposing the reinforcing grid between said two sheets with the adhesive surfaces of the sheets contiguous and lying in planes displaced from said common tangential planes, and with the edges overlapping the edges of the metal grid on all sides, thereby forming air flow channels between and defined by the longitudinal members and said adhesive surfaces,

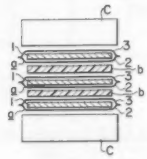
evacuating air through said air flow channels and from between the sheets to thereby draw said adhesive surfaces together around the periphery of the metal grid and in the areas existing between the longitudinally extending members and joining members, and

effecting adhesion between said adhesive surfaces.

3,932,250
METHOD FOR MANUFACTURING METAL FOIL- OR PLASTIC FILM-OVERLAID LAMINATE

Shunichi Sato; Masaharu Kurata; Toshiyuki Takao; Sadao Masaki; Toru Notomi; Morio Gaku, and Takehiko Moriya, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Co., Ltd., Tokyo, Japan

Filed May 30, 1974, Ser. No. 474,803
Claims priority, application Japan, May 30, 1973, 48-60544
Int. Cl.² C09J 5/00
U.S. Cl. 156—213 16 Claims

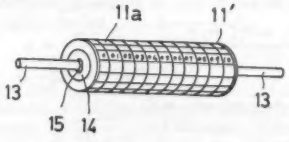


1. A method for manufacturing a metal foil- or plastic film-overlaid laminate, which comprises completly covering a cleaned press plate with at least one member selected from the group consisting of cleaned metal foils and cleaned plastic films, in such a manner that the pressing surface of the press plate comes in intimate contact with the face side of said member, partially or completely sealing the resulting covering along at least two edges of the press plate, two of the edges being opposite to each other, applying the covered press plate to one or both sides of a laminating base, subjecting the resulting assembly to a laminating apparatus with heating under pressure, taking the assembly out of the laminating apparatus, and thereafter opening the covering to remove the press plate.

3,932,251
METHOD FOR MANUFACTURING AN INK-CONTAINABLE STAMP

Tomoji Tanaka, No. 19-8, Takarayama-cho, Toyonaka, Osaka, Japan

Filed May 16, 1974, Ser. No. 470,494
Int. Cl.² B41C 3/00; B41N 1/22
U.S. Cl. 156—245 7 Claims



1. A method for manufacturing an ink-containable stamp which comprises the steps of:

a. forming a mixture of synthetic resins comprising a mixture of polyvinyl acetate and polyolefin resin containing 40 to 90% polyolefin resin, with one or more fillers insoluble in glycols and extractable from the resin by the use of an acid solution containing an urea complex or an organic acid, stabilizers, pigments and solvents;

b. separately molding a number of printing types, and a drum or plate having a number of concave portions from said mixture;

c. irradiating the printing types and the drum or plate with gamma-rays;

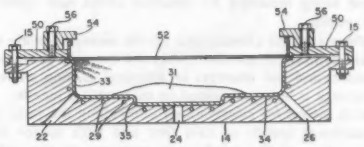
d. immersing the printing types and the drum or plate in a pepsin solution and then in an acid solution thereby extracting the fillers to form porosity in the printing types and the drum or plate;

e. installing the printing types in the concave portions of the drum or plate by the use of a binder.

3,932,252
PROCESS FOR THE MANUFACTURE OF COMPOSITE FOAM AND FABRIC ARTICLES

Terrill Wayne Woods, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 18, 1974, Ser. No. 515,865
Int. Cl.² B29D 27/04
U.S. Cl. 156—245 13 Claims



1. A process for making composite articles having a porous cover which will breathe and having a foamed core which does not extend through the pores of the cover, the process comprising: coating one side of a porous cover with a strippable, foam impervious coating; lining a mold with the porous cover with the strippable coating facing the mold; foaming a foamable mixture in the mold to form a composite article; removing the article from the mold; and stripping off the strippable coating.

3,932,253
METHOD FOR FORMING A MAGNET PATTERN ON MAGNETIC MEMORY CIRCUIT CARDS

Paul F. Elarde, Naperville; F. A. Klasek, LaGrange Park, and George O. McCormick, LaGrange, all of Ill., assignors to Western Electric Company, Inc., New York, N.Y.

Filed June 3, 1974, Ser. No. 476,118
Int. Cl.² B32B 31/20, 31/12; B41M 3/08; H05K 1/00
U.S. Cl. 156—249 10 Claims

9. In a method of forming a pattern of a first material on a surface of a second material:

pressing the pattern of the first material directly against a surface of a sheet of malleable material to deform the malleable material to secure the pattern within the surface thereof;

placing the pattern bearing surface of the malleable material over the surface of the second material;

pressing a surface of the malleable material, opposite from the pattern bearing surface, to force the pattern of the first material from the surface of the malleable material and against the surface of the second material, and

adhesively securing the pattern of the first material to the surface of the second material.

3,932,254
APPARATUS FOR SEMI-CONTINUOUS PRODUCTION OF LENGTHY HELICAL WAVE GUIDES

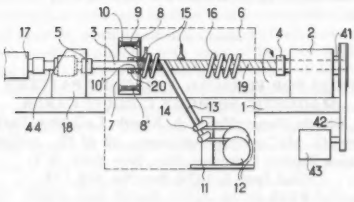
Georges N. Comte, Saint-leu-la-Foret, France, assignor to Cables de Lyon Alsacienne, Lyon, France

Continuation-in-part of Ser. No. 875,685, Nov. 12, 1969, abandoned. This application Dec. 12, 1972, Ser. No. 314,478
Claims priority, application France, Nov. 15, 1968, 68.174027; July 24, 1969, 69.25333; July 25, 1969, 69.25588
Int. Cl.² B65H 81/00, 81/08
U.S. Cl. 156—361 6 Claims

1. A machine for the semi-continuous manufacture of wave-guides of considerable length from a plurality of sections of wave-guides of a standard length, said machine comprising:

a. a cylindrical mandrel;

b. first means for rotating said cylindrical mandrel during the manufacture of each section of wave-guide;
c. a carriage movable relative to said cylindrical mandrel in the direction parallel to the axis thereof;
d. second means for displacing said carriage from a first end of said cylindrical mandrel to the second end thereof during the manufacture of each section of wave-guide in synchronism with the rotational movement of the latter;
e. third means for displacing said carriage from the second end of said cylindrical mandrel to the first end thereof in between the manufacture of each section of wave-guide;
f. fourth means for winding wire on said cylindrical mandrel, said fourth means being movable with said carriage and being mounted for rotation about said cylindrical mandrel;
g. fifth means for causing said fourth means to rotate about said cylindrical mandrel, whereby the wire is wound on said cylindrical mandrel in a helical fashion while said carriage is being displaced by said second means;
h. sixth means for continuously controlling the ratio of the rotational speeds of said first and fifth means during operation of the machine in response to the angle at which wire is wound on said cylindrical mandrel such that the winding angle relative to the axis of said cylindrical mandrel remains constant, thereby maintaining a constant winding pitch of the wire so as to obtain contiguous turns;

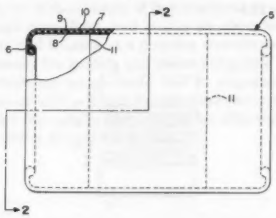


i. seventh means for distributing tape on the wire wound on said cylindrical mandrel, said seventh means being mounted on and movable with said carriage, whereby the combination of the translational motion of said carriage and the rotational motion of said mandrel causes the tape to be wound on the wire in a helical fashion;
j. eighth means for displacing said cylindrical mandrel and a section of wave-guide manufactured on said cylindrical mandrel (i) parallel to the axis of said cylindrical mandrel, (ii) in the direction of the first end of said cylindrical mandrel, and (iii) by an amount equal to the standard length of a section of wave-guide, thereby moving said cylindrical mandrel and a section of wave-guide manufactured on said cylindrical mandrel from a first position to a second position;
k. ninth means for gripping and immobilizing a section of wave-guide manufactured on said cylindrical mandrel after said cylindrical mandrel and the section of wave-guide are in the second position; and
l. 10th means for displacing said cylindrical mandrel from its second position to its first position by a motion which is (i) parallel to the axis of said cylindrical mandrel, (ii) in the direction of the second end of said cylindrical mandrel, and (iii) equal in length to the standard length of a section of wave-guide while said ninth means remains actuated, whereby said cylindrical mandrel is withdrawn from the section of wave-guide and is returned to its first position while the section of wave-guide remains in its second position.

3,932,255
METHOD OF MAKING AN IMPROVED TIRE BUILDING SLEEVE AND SAID SLEEVE

Jeffrey W. Saracsan, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 372,896, June 22, 1973, abandoned. This application July 20, 1974, Ser. No. 490,147
Int. Cl.² B29H 17/16
U.S. Cl. 156—401 5 Claims

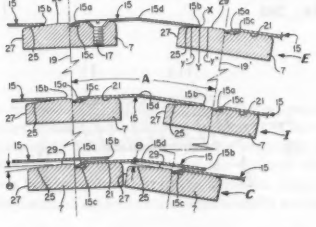


1. A sleeve for a tire building machine, including an inflatable body portion having dimensions suitable for attachment in operative relationship with a tire building machine, said body portion comprising an inner layer or core of a cured compounded elastomer selected from the class of rubber polymers consisting of natural, high cis-polybutadiene, high cis-polyisoprene, acrylonitrile-butadiene and butadiene stryene and at least one coat of a polyurethane elastomer which extends around the ends of the inner layer past at least the area that contacts the drum, said polyurethane elastomer containing 0.5 to 10 percent by weight of a silicone polycarbinol or silicone polycarbinal.

3,932,256
TIRE BUILDING DRUM

John W. Touchette, Hartville, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 19, 1974, Ser. No. 498,494
Int. Cl.² B29H 17/16
U.S. Cl. 156—417 5 Claims



1. In a tire building drum having a plurality of segments in cylindrical array and movable radially toward and away from the drum axis and having in an expanded condition of such drum arcuate spaces between the segments thereof and cover plates bridging each of said spaces, which plates cooperate with the respective segments to provide a peripherally and axially continuous working surface on said drum, the improvement comprising the combination wherein each cover plate is longitudinally coextensive with its two associated segments and has a fixed longitudinal edge rigidly affixed to one of said segments and a free longitudinal edge radially outward of and overlying the other of said segments, said plate having an arched contour convex outwardly of said axis is provided with a base surface extending parallel said drum axis and normal to the radial plane of movement of such segment and a longitudinally extending support surface inclined inwardly from said

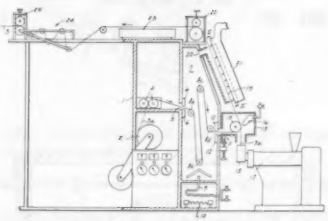
base surface to underlie and to support said free edge only when a radially inward load is applied to said cover plate.

3,932,257

MECHANISM FOR MAKING A FLEXIBLE CLOSURE

Takashi Noguchi, c/o Seisan Nippon Sha, Ltd., New Kohjimachi Building, 3, 5-chome, Kohjimachi, Chiyoda Tokyo, Japan

Division of Ser. No. 178,087, Sept. 7, 1971, Pat. No. 3,784,432. This application Aug. 31, 1973, Ser. No. 393,446
Int. Cl.² B29C *23/00*
U.S. Cl. 156—497 10 Claims



1. A mechanism for forming sheets having strip means thereon comprising in combination:

means for supplying a continuous sheet of plastic film;

means heating the sheet in a preheating chamber to a predetermined temperature sufficient to permit fusion to a plastic strip but less than the deterioration temperature of the film;

means connected for controlling the temperature in said preheating chamber so that the sheet is heated to fusion temperature;

an extruder for extruding a heated plastic strip having a small critical profile;

means defining a joining zone adjacent the extruder wherein the newly extruded strip is immediately fed onto the surface of the heated sheet while the plastic is hot so that the strip is fused to the sheet;

and air jet means of a width to limit air flow onto the strip and profile for increasing its rate of cooling while said sheet remains heated.

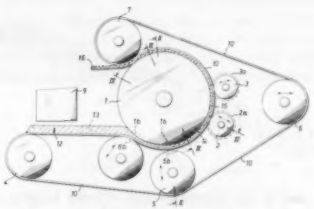
3,932,258

APPARATUS FOR THE CONTINUOUS PRODUCTION OF CHIPBOARD, FIBREBOARD AND LIKE PANELS

Heinz Brinkman, Bennigsen; Rolf Gersbeck, Hannover, and Berndt Greten, Springe, all of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hannover-Kleefeld and Bison-Werke Bahre & Greten GmbH & Co. KG, Springe, both of, Germany

Filed June 10, 1974, Ser. No. 477,981
Claims priority, application Germany, June 9, 1973, 2329599
Int. Cl.² B29J *5/00;* B32B *21/00;* B29D *7/14*
U.S. Cl. 156—498 13 Claims

1. Apparatus for the continuous production of panels of uniform weight and thickness over their entire width from compacted material, comprising a tensioned endless steel belt, drive means for moving said belt longitudinally, a plurality of rollers, a revolvable press drum, an outer shell for said drum, said belt being guided over said rollers and partially around said drum such that said rollers press said belt against said drum, heating means for said drum, and sprinkler apparatus disposed over a portion of said belt which extends horizontally before said drum in the direction of movement of said belt; said belt, said rollers, said drum, and said sprinkler apparatus being relatively so disposed that material to form said panels sprinkled onto said portion of said belt is pressed between said belt and said drum to form a web of material, at least one of said plurality of rollers having over its width a convexly



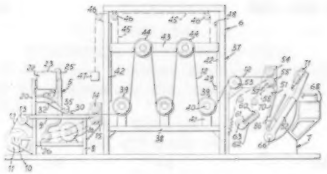
ground surface, the degree of convexity of said roller being determined by the degree of buckling deformation of said drum experienced in operation and by the inherent flexion of said roller when loaded having regard to the elasticity modulus of the material from which said roller is formed.

3,932,259

METHOD AND APPARATUS FOR THE MANUFACTURE OF SHEETS FOR HOLDING POSTAGE STAMPS OR THE LIKE

Adriana Marini, 7, Via Tancredi Gallimberti, and Giacomo Marini, 35, Viale Quartara, both of Genoa, Italy

Filed June 27, 1973, Ser. No. 373,909
Claims priority, application Italy, July 7, 1972, 12772/72; May 25, 1973, 12639/73
Int. Cl.² B32B *31/10*
U.S. Cl. 156—510 8 Claims

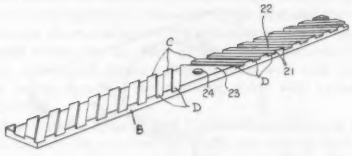


1. A machine for manufacturing mounting sheets for philatelistic use or the like, comprising, means for applying a plurality of continuous spaced apart parallel lines of glue to one side of a continuous sheet of transparent material, means for supplying said glued sheet of transparent material to a punching press, said punching press including means for receiving and supporting a support sheet, said punching press having a punching means for simultaneously punching out of said transparent sheet a plurality of selected portions thereof, each of which portions include a segment of one of said lines of glue located along one edge thereof and facing the support sheet, and for compressing said portions against the support sheet, without cutting the support sheet, so as to cause the glue to adhere the selected portions to the support sheet with an unglued remainder of each portion being separable from the surface of the support sheet.

3,932,260
HEAT SPLICING APPARATUS

George H. Balentine, Jr., State Park Road, Greenville, S.C. 29609

Filed July 24, 1974, Ser. No. 491,403
Int. Cl.² B30B 15/34
U.S. Cl. 156—583 1 Claim



1. For use in an apparatus for splicing lengths of textile fabric in end to end relation by application of heat to heat fusible bonding material at overlapping end portions of said lengths of fabric, having a narrow elongated first jaw and a complementary second jaw, at least one of said jaws being heated, each being movable toward and away from the other for such application of heat, the improvement including:

a series of alternate ridges and depressions extending along a face of one of said jaws forming a substantially herringbone configuration thereacross; and

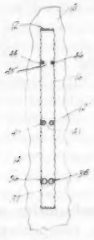
said ridges and depressions on one side of said face converge toward said ridges and depressions on the other side of said face at a medial portion thereof;

whereby a splice formed between said jaws across said fabric offers a uniform resistance to longitudinal forces exerted on said fabric but which permits lateral stretching of the splice.

3,932,261
ELECTRODE ASSEMBLY FOR AN ELECTROLYTIC CELL

Morton S. Kircher, Oakville, Canada, and Judson A. Wood, Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed June 24, 1974, Ser. No. 482,295
Int. Cl.² C25B 11/02
U.S. Cl. 204—288 11 Claims



1. An electrode assembly suitable for use in a cell for the electrolysis of alkali metal chloride solution which comprises:

a. an electrode plate positioned vertically,

b. two electrode surfaces positioned in parallel and having a space between said electrode surfaces,

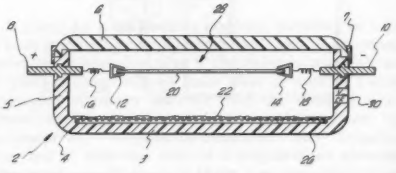
c. at least two conductive supports, one said conductive support separately attached to each of said electrode surfaces and positioned in said space between said electrode surfaces, and,

d. openings in said electrode plate for attachment of said conductive supports, said conductive supports being attached substantially perpendicular to said electrode plate, said conductive supports adapted to conduct current between said electrode plate and said electrode surfaces, and said conductive supports adapted to permit continuous but restricted flow of said alkali metal chloride solution up through said space between said electrode surfaces.

3,932,262
PORTABLE ELECTROPHORESIS APPARATUS USING MINIMUM ELECTROLYTE

Mario R. Stevens, Glendora, and John Michael Vickers, La Canada, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Oct. 15, 1973, Ser. No. 406,296
Int. Cl. B01k 5/00
U.S. Cl. 204—299 12 Claims



1. An electrophoresis unit that is useable for conducting electrophoretic analyses of specimens mounted on substrates that have been saturated with an electrolyte, said electrophoresis unit comprising:

a sealable container having an interior cavity defined by container walls;

means for sustaining a saturated electrolytic vapor in said cavity of said container; and

electrode means for suspending said substrate within said cavity of said container, said electrode means extending from outside said container through the walls thereof and including a pair of securing members for suspending said substrate therebetween and within said cavity, and a pair of terminal members respectively connected to said securing members for being connected to provide direct current power thereto.

3,932,263
ELECTROPHORESIS SLIDE MOUNTING MEANS

Paul E. Brefka, Southborough, Mass., assignor to Millipore Corporation, Bedford, Mass.

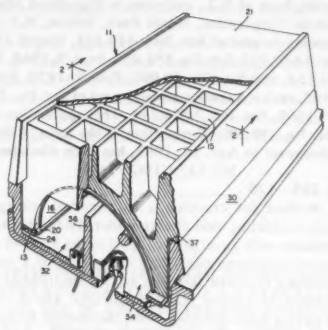
Filed Nov. 4, 1974, Ser. No. 520,286
Int. Cl.² B01K 5/00
U.S. Cl. 204—299 3 Claims

1. In an electrophoresis migration apparatus having a mounting block with a concave cylindrical external surface for mounting and holding an electrophoresis slide, the improvement comprising;

a first slide retaining member fastened adjacent one edge of said concave cylindrical surface and extending in a direction substantially normal to said surface, said first retaining member being formed of a resilient soft material;

a second retaining member formed of a substantially rigid material, said second retaining member being mounted near the opposite edge of said concave cylindrical surface and extending in a direction substantially normal to said concave cylindrical surface toward said first retaining member, whereby an electrophoresis slide may be

mounted and maintained compressed against said concave cylindrical surface by the resilient action of said first

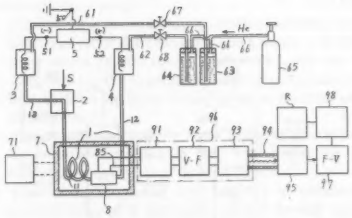


member compressing said slide lengthwise against said second rigid member.

3,932,264
ELECTROPHORETIC MEASUREMENT SYSTEM INCLUDING MEANS FOR DETERMINING ZONE BOUNDRIES

Tatsuro Haruki, Nishinomiya, and Junichi Akiyama, Kyoto, both of Japan, assignors to Shimadzu Seisakusho Ltd., Kyoto, Japan

Filed Nov. 12, 1973, Ser. No. 414,970
Int. Cl.² B01K *5/00*
U.S. Cl. 204—299 **14 Claims**



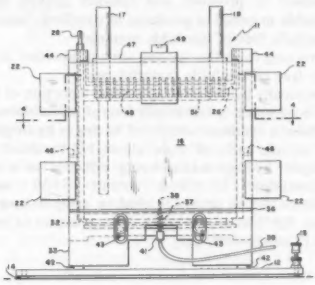
1. An electrophoretic measurement system comprising: an electrophoretic column means (11, 12, 13); sample introducing means for introducing a sample into said column means, power means (5) for generating a potential gradient along said column means; detector means (8) for sensing zone boundaries produced within said column means and providing an electrical output signal; signal transmitter means (93) for receiving the output electrical signal from said detector means and transmit it as a wave; converter means (95) disposed for receiving said wave and generating an electrical signal in response to said transmitted wave; reading means for reading the output signal from said converter means.

3,932,265
VERTICAL GEL SLAB ELECTROPHORESIS APPARATUS

Stanton A. Hoefer, San Francisco, Calif., assignor to Hoefer Scientific Instruments, San Francisco, Calif.

Filed Mar. 28, 1974, Ser. No. 455,871
Int. Cl.² B01K *5/00*
U.S. Cl. 204—299 **24 Claims**

1. Apparatus for vertical formation and use of a gel slab in electrophoresis comprising an outer container opening upwardly forming an upper buffer chamber, an inner container shaped for placement within said outer chamber and opening upwardly forming a lower buffer chamber, first and second separable opposed vertical side walls together with first and second separable opposed vertical end walls defining a vertical gel slab chamber therebetween, said vertical gel slab chamber opening upwardly in communication with said upper buffer chamber and opening downwardly in communication with said lower buffer chamber, a sealing gasket for sealing the end of said vertical gel slab chamber opening downwardly, whereby separating gel solution may be retained therein prior to polymerization, said sealing gasket adapted to admit a filling device therethrough into said gel slab chamber for filling without turbulence, removable means for retaining said

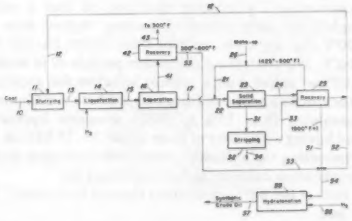


sealing gasket against the end of said gel slab chamber opening downwardly, adjustable means for securing said walls defining said vertical gel slab chamber together and to one side of said inner container, a first electrode extending into said upper buffer chamber, and a second electrode extending into said lower buffer chamber, whereby when said gel slab chamber is filled with separating gel solution through the filling device, the separating gel solution is polymerized, and said sealing gasket is removed, said upper and lower buffer chambers may be filled with buffer solution, a sample laid atop the polymerized separating gel under the buffer solution in said upper buffer chamber, and voltage applied across said first and second electrodes to cause electrophoretic separation of the sample in the gel slab.

3,932,266
SYNTHETIC CRUDE FROM COAL

Morgan C. Sze, Upper Montclair, and George J. Snell, Fords, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Dec. 12, 1973, Ser. No. 423,903
Int. Cl.² C10G *1/04*
U.S. Cl. 208—10 **14 Claims**



1. A process for producing synthetic crude oil from coal, comprising:

a. contacting coal in admixture with a coal liquefaction solvent with hydrogen to effect hydrogenation thereof,

said hydrogenation being effected with a hydrogen consumption of from 4,000 to 12,000 SCF/ton MAF coal, a temperature of from 650°F to 900°F and a pressure of from 500 psig to 4,000 psig.

b. introducing liquefied coal, containing insoluble material and a liquid promoter into a gravity settling zone to separate insoluble material by gravity settling, said liquid promoter having a 5 volume percent distillation temperature of at least about 250°F and a 95 volume percent distillation temperature of at least about 350°F and no greater than about 750°F, said liquid having a characterization factor (K) of at least 9.75, said liquid having a characterization factor greater than said coal liquefaction solvent, said promoter liquid being added in an amount sufficient to promote and enhance gravity settling of insoluble material to produce, as overflow, liquefied coal essentially free of insoluble material;

c. recovering from the settling zone a liquefied coal essentially free of insoluble material; and

d. catalytically hydrogenating at least a portion of the liquefied coal which is essentially free of insoluble material to produce a synthetic crude oil having a hydrogen to carbon atomic ratio of from about 1.2 to about 1.8, said catalytic hydrogenation being effected at a hydrogen consumption of from about 7500 to about 20,000SCF/ton of MAF coal, a temperature of from about 500°F to about 900°F and a pressure of from about 500 to about 5000 psig.

3,932,267

PROCESS FOR PRODUCING UNINHIBITED TRANSFORMER OIL

Robert William Lewis, Houston, and Lawrence Walker Maas, Pasadena, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sept. 11, 1974, Ser. No. 505,129
Int. Cl.² C10G *34/00*
U.S. Cl. 208—87 **5 Claims**

1. In a method for producing an uninhibited transformer oil comprising:

A. contacting a petroleum distillate oil that is primarily naphthenic and aromatic, boiling higher than about 400°F, having a viscosity of from about 50–100 SSU at 100°F, and containing sulfur compounds of at least about 0.08%wt sulfur with a solvent selective for aromatic hydrocarbons under conditions to produce a raffinate phase containing from 15% to 30%v aromatic hydrocarbons and having a viscosity of from about 55–75 SSU at 100°F,

B. contacting the raffinate phase with hydrogen and a hydrogenation catalyst under conditions to

i. reduce the nitrogen content thereof to at most 25 PPM, and

ii. maintain the aromatic hydrocarbon content thereof greater than 15%v, and

C. recovering a transformer oil, the improvement comprising in step B contacting with catalyst is effected to maintain the sulfur content of the raffinate phase greater than 0.1%w.

3,932,268

HYDROCARBON CONVERSION PROCESS

Walter L. Haden, Jr., Westfield, and Frank J. Dzierzanowski, Somerset, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Menlo Park, Edison, N.J.

Continuation-in-part of Ser. Nos. 810,325, March 25, 1969, Pat. No. 3,647,718, Ser. No. 856,458, Sept. 9, 1969, Pat. No. 3,657,154, and Ser. No. 10,005, Feb. 9, 1970, Pat. No. 3,663,165, each is a continuation-in-part of Ser. No. 738,384, June 20, 1968, Pat. No. 3,506,594. This application Nov. 16, 1971, Ser. No. 199,305. The portion of the term of this patent subsequent to Apr. 14, 1987, has been disclaimed.
Int. Cl.² C10G *11/04*
U.S. Cl. 208—120 **2 Claims**

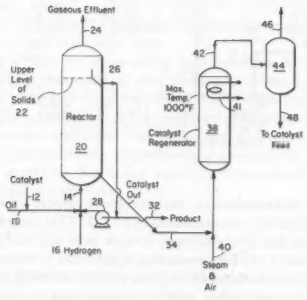
1. A method for cracking a hydrocarbon charge which comprises contacting said charge under fluid catalytic cracking conditions with a cracking catalyst in the form of attrition-resistant microspheres consisting essentially of a mixture of ion-exchanged synthetic faujasite and an amorphous alumina-silica residue of caustic leached calcined kaolin clay, said mixture having been obtained when the sodium form of faujasite was crystallized in situ by hydrothermal treatment of a suspension of amorphous silica-alumina microspheres comprising calcined clay in a dilute sodium hydroxide solution, said calcined clay having undergone the kaolin exotherm during calcination, said cracking catalyst microspheres analyzing, on a volatile-free weight basis, at least 90 percent combined SiO_2 and Al_2O_3 in a SiO_2/Al_2O_3 molar ratio within the range of 0.8 to 1.4/1 and less than 3 percent Na_2O.

3,932,269

HYDROGENATION OF HYDROCARBON RESIDUUM

Leon M. Lehman, Miami Beach, Fla., assignor to Hydrocarbon Research, Inc., Morristown, N.J.

Filed July 14, 1972, Ser. No. 271,638
Int. Cl.² B01J *37/14*; C10G *13/02, 13/14*
U.S. Cl. 208—157 **6 Claims**



1. In the process for the hydrocracking of a residuum oil in an ebullated bed reactor to convert at least 50 weight percent of the hydrocarbons boiling above 975°F in a reaction zone at a pressure between about 300 and 1000 psi of hydrogen when a temperature between about 750° and 850°F is used and at a pressure between about 1000–3000 psi when a temperature between about 900° and 950° is used by contacting said oil with a hydrocracking catalyst wherein coke deposits on the catalyst to reduce its activity and fresh catalyst is added to maintain a desired average catalyst activity at a rate such that between 5 and 20 barrels of oil are processed per pound of fresh catalyst and wherein the oil and hydrogen pass upwardly through the reaction zone under conditions to maintain the catalyst in random motion with substantial carryover of catalyst with liquid effluent from the reaction zone, the improvement comprising:

a. continuously removing said catalyst from said reaction zone at a rate at least twice as great as the rate of addition of fresh catalyst;
b. regenerating said catalyst to remove deposited carbon; and
c. recycling an appropriate portion of the regenerated catalyst to said reactor at a rate supplementing the rate of addition of fresh catalyst so as to maintain the desired inventory of total catalyst in the reactor and processing between 0.5 and 3.0 bbl/lb of carbon-free catalyst, both fresh and regenerated added to the reactor.

3,932,270

METHOD FOR DETERMINING HYDROCARBON HYDROTREATING ACTIVITY OF A CATALYST PRIOR TO ITS USE IN A HYDROTREATING PROCESS

Marvin F. L. Johnson, Homewood, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 470,885, May 17, 1974. This application Feb. 20, 1975, Ser. No. 551,563
Int. Cl.² C10G 23/02
U.S. Cl. 208—216 7 Claims

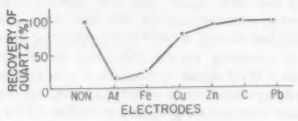
1. A hydrocarbon hydrotreating process which comprises:
1. determining the hydrocarbon hydrotreating activity of a first catalyst comprising a major amount of a porous alumina support, a minor catalytically-effective amount of nickel, at least a portion of said nickel being present in the N++ form, and a minor catalytically-effective amount of at least one additional metal selected from the group consisting of molybdenum, tungsten, and mixtures thereof, at least a portion of said one additional metal being presesnt in an oxidized state, said hydrocarbon hydrotreating activity being determined according to a method comprising:
a. determining the maximum relative reflectance of said first catalyst of light having a wave number in the range from about 16,000 cm.$^{-1}$ to about 17,000 cm.$^{-1}$;
b. determining the maximum relative reflectance of said first catalyst of light having a wave number of about 20,000 cm^{-1};
c. determining an activity ratio equal to the relative reflectance determined in step (a) minus the relative reflectance determined in step (b);
d. performing steps (a), (b) and (c) to determine the activity ratio of a standard catalyst having essentially the same elemental composition as said first catalyst and acceptable hydrocarbon hydrotreating activity;
e. comparing the activity ratios obtained in steps (c) and (d), provided that (1) an increase in activity ratio from step (c) to step (d) being indicative of reduced hydrocarbon hydrotreating activity of said first catalyst relative to said standard catalyst, (2) no change in activity ratio from step (c) to step (d) being indicative of essentially equal hydrocarbon hydrotreating activity of said first catalyst relative to said standard catalyst and (3) a decrease in activity ratio from step (c) to step (d) being indicative of greater hydrocarbon hydrotreating activity of said first catalyst relative to said standard catalyst;
2. contacting a hydrocarbon feedstock containing at least one contaminant selected from the group consisting of sulfur, nitrogen and mixtures thereof with hydrogen in the presence of said first catalyst at conditions such that hydrogen forms compounds with at least one of said contaminants, provided that said first catalyst has a hydrocarbon hydrotreating activity at least essentially equal to that of said standard catalyst; and
3. recovering a hydrocarbon material having a reduced content of at least one of said contaminants relative to said feedstock.

3,932,271

ELECTRIC PRECONDITIONING IN SELECTIVE FLOTATION OF OXIDIC TYPE ORES

Ikuo Nagano, Hino; Kozo Saitoh, Tokyo, and Hiroshi Tanaka, Chofu, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1974, Ser. No. 431,927
Claims priority, application Japan, Jan. 13, 1973, 48-006781
Int. Cl.² B03B 1/00
U.S. Cl. 209—9 9 Claims



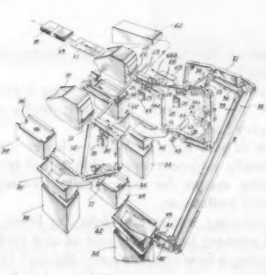
1. A method of ore separation which comprises: electrically preconditioning an ore pulp containing mixed oxide ore particles selected from the group consisting of (1) mixtures of zinc oxide and silica, (2) mixtures of zinc oxide and calcium oxide, (3) mixtures of zinc oxide and kaolin, (4) mixtures of manganese oxide and silica and (5) mixtures of silica and calcium carbonate, by applying DC current to said ore pulp from electrodes inserted in said pulp, at a current density of from 0.002 to 20 A/dm² and at a voltage of from 0.5 to 750 V, for a period of time effective to change the surface electric potentials of the ore particles to alter their flotation characteristics to improve the flotability of zinc oxide in the case of mixtures (1) and (2), to depress the flotability of zinc oxide in the case of mixture (3), to depress the flotability of manganese oxide in the case of mixture (4), and to improve the flotability of silica in the case of mixture (5), and to improve their separation characteristics; discontinuing application of said DC current and then subjecting said electrically preconditioned pulp to froth flotation in a flotation cell, and recovering from the flotation cell a concentrate of zinc oxide in the case of mixtures (1), (2) and (3), manganese oxide in the case of mixture (4), and silica in the case of mixture (5).

3,932,272

SCAN SYSTEM

W. Robert Carnes, Jr., Darien, and John J. Balogh, Jr., Trumbull, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 2, 1974, Ser. No. 457,375
Int. Cl.² B07C 9/00; B65H 7/12
U.S. Cl. 209—73 7 Claims



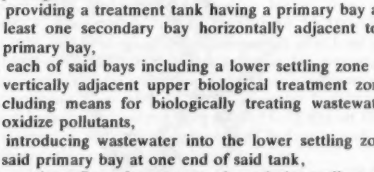
1. A currency processing system for analyzing and sorting a quantity of bills having differing fitness characteristics, comprising: means for introducing a strap of bills into said system, first strap counting means for counting each bill in said strap

of bills introduced into said system, said first strap counting means providing a predetermined strap count, automatic conveying means for conveying each bill of said strap along a feed path within said system, said feed path including means for detecting and analyzing each bill for entry conditions and quality conditions, and accumulating means for storing said bills according to their fitness, said detecting and analyzing means providing a first signal for each bill meeting certain entry conditions, and a second signal for each bill meeting certain quality conditions, a second strap counting means operatively coupled to said detecting and analyzing means for receiving said first signal, said first signal incrementing said second strap counting means, said first strap counting means being coupled to said second strap counting means, said second strap counting means providing an incremented strap count and a third signal responsive to a coincidence between said predetermined strap count and said incremented strap count, said accumulating means including a first accumulator for accumulating bills meeting entry conditions and one of at least two quality fitness conditions, and a second accumulator for accumulating bills meeting entry conditions and the other of said two fitness quality conditions, first accumulator counting means for counting bills at said first accumulator, second accumulator counting means for counting bills at said second accumulator, and means for receiving said third signal and being responsive to said third signal for disabling said conveying means and stopping further accumulation, said first and second accumulator counting means providing a combined count for verifying said incremented strap count.

3,932,273
METHOD FOR THE PRIMARY AND SECONDARY TREATMENT OF WASTEWATER IN A UNITARY APPARATUS

Wilbur N. Torpey, Douglaston, and Richard A. Sullivan, Woodside, both of N.Y., assignors to Autotrol Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 386,860, Aug. 9, 1973, Pat. No. 3,849,304. This application Nov. 14, 1974, Ser. No. 523,701
Int. Cl.[2] C02C *1/04*
U.S. Cl. 210—17 **8 Claims**



1. Method for the continuous treatment of wastewater comprising

a. providing a treatment tank having a primary bay and at least one secondary bay horizontally adjacent to said primary bay,

b. each of said bays including a lower settling zone and a vertically adjacent upper biological treatment zone including means for biologically treating wastewater to oxidize pollutants,

c. introducing wastewater into the lower settling zone of said primary bay at one end of said tank,

d. creating a flow of wastewater through the settling zone of said primary bay in a direction away from said one end,

e. dividing wastewater from the settling zone of said primary bay into at least two portions

f. creating a flow of one of said portions through the biological treatment zone of said secondary bay,

g. creating a flow of another of said portions through the biological treatment zone of said primary bay,

h. said portions of wastewater flowing through said biological treatment zones in parallel and toward said one end of said tank,

i. directing wastewater from the biological treatment zone of said primary bay to the settling zone of said secondary bay,

j. directing wastewater from the biological treatment zone of said secondary bay to the settling zone of said secondary bay,

k. creating a flow of wastewater from the biological treatment zones of each of said primary and secondary bays through the settling zone of said secondary bay in a direction away from said one end of said tank and countercurrent to the direction of wastewater flow through the upper biological treatment zone of said secondary bay, and

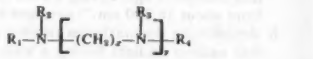
l. removing treated wastewater from the settling zone of the secondary bay at the end of said tank opposite said one end.

3,932,274
METHOD FOR ELIMINATING METALS FROM A SOLUTION CONTAINING A VERY SLIGHT AMOUNT OF THE METALS

Gaku Izumi; Tetsuo Kimura; Katsuyoshi Mori, and Michiko Koizumi, all of Sendai, Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Continuation of Ser. No. 283,797, Aug. 25, 1972, abandoned. This application June 11, 1974, Ser. No. 478,244
Claims priority, application Japan, Aug. 27, 1971, 46-66195
Int. Cl.[2] C02B *1/18*
U.S. Cl. 210—44 **4 Claims**

1. A method for eliminating heavy metal ions from a solution containing a minute amount of heavy metal ions comprising treating said solution with a metal sequestering agent consisting essentially of a higher alkylated polyamine of the general formula:



wherein:

R_1 is an alkyl, hydroxyalkyl, or alkoxyalkyl group having about 8–24 carbon atoms,

R_2 is a hydrogen atom, the same as R_1, or a $-\{(CH_2)_x-N(R_3)\}_y R_4$ group,

R_3 and R_4 each are a hydrogen atom or the same as R_1

x is an integer from 1 to 4 and

y is an integer from 1 to 3, or a water-soluble addition salt of said polyamine with an organic or inorganic acid;

blowing air into the treated solution to form bubbles and separating the metal sequestering agent from the solution through adsorption of said bubbles.

3,932,275
PROCESS FOR THE TREATMENT OF MINERAL SLIMES

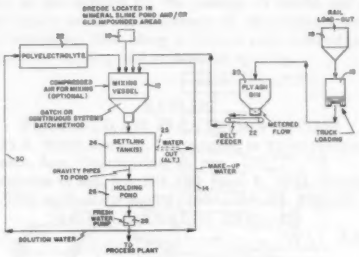
Arthur Raymond Mewes, Dayton, Ohio; Robert W. Styron, Atlanta, and Mark Harris Smith, Woodstock, both of Ga., assignors to AMAX Resource Recovery Systems, Inc., Dayton, Ohio

Filed Aug. 29, 1974, Ser. No. 501,620
Int. Cl.[2] C02B *1/20*
U.S. Cl. 210—49 **4 Claims**

1. A method of dewatering about 5% phosphate slimes comprising adding ingredients consisting essentially of fly ash slurry and a low anionic polyacrylamide solution to said slime in the following manner:

a. adding the fly ash slurry to the slime to be treated at a rate of approximately 0.2% by weight of total slime solution and thoroughly and gently mixing the resulting solution, followed relatively soon thereafter by the step of

b. adding the polyacrylamide solution to the admixed fly ash and slime solution and thoroughly and gently mixing to initiate coagulation, said polyacrylamide having a concentration of approximately 0.002% and being added at the rate of 10–25% by weight of the total slime solution,



c. allowing the coagulated solids to settle, and

d. drawing off clear water separated from the coagulated solids on settling.

3,932,276

FILTRATION AIDS IN URANIUM ORE PROCESSING

Harold L. Ford, Arvada, Colo.; Nathan M. Levine, Stamford, Conn., and Alan Robert Risdon, S. River, N.J., assignors to Stein, Hall & Co., Inc., New York, N.Y.

Filed May 9, 1974, Ser. No. 468,793

Int. Cl.² B01D *21/01*

U.S. Cl. 210—54 **6 Claims**

1. A process of improving the filtration efficiency and separation of uranium containing pregnant solutions from the solid tailings of uranium ore pulps obtained by carbonate leaching of uranium ore which comprises mixing said ore pulps with an aqueous solution containing 0.1 to 1 weight percent based on the total weight of the solution of hydroxyalkyl guar having a molar substitution (M.S.) of about 0.1 to 3.0 and selected from the group consisting of hydroxyethyl and hydroxypropyl guar in the amount of 0.1 to 2.0 pounds of hydroxyalkyl guar per ton of uranium ore and filtering said ore pulps and guar, said mixing and filtering taking place at a temperature of about 150° to 180°F.

3,932,277

METHOD AND APPARATUS FOR SEPARATING BLOOD FRACTIONS

Clifton Eugene McDermott, and Franklin Dee Wareham, both of Salt Lake City, Utah, assignors to Bio-Logics Products, Inc., Salt Lake City, Utah

Filed Mar. 29, 1974, Ser. No. 456,168

Int. Cl.² B01D *33/00*; **G01N** *33/16*

U.S. Cl. 210—77 **18 Claims**

1. Apparatus for permanently separating the serum fraction from the cell fraction of a spun blood sample in a sample vessel comprising

a collection tube having a small diameter orifice tube projecting from one end thereof; and

a head releasably fitted on the one end of the collection tube and having at least one sealing flange extending outwardly therefrom to sealingly engage the wall of the sample vessel and to immobilize the head as the collection tube is withdrawn therefrom, a bore hole extending through said head and having diameter smaller than the outer diameter of the orifice tube but expanding when said orifice tube is inserted thereinto to effectively seal when said orifice tube is removed therefrom and said sealing flange is compressed within the sample vessel.

18. A method of separating the serum fraction from the cell fraction of a spun blood sample in a sample vessel, comprising

moving a barrier within the sample vessel to a position between the serum and cell fractions while moving the serum fraction through a filter and the barrier into a collection tube;

removing the collection tube and blocking flow through the barrier, while leaving the barrier positioned in the sample vessel;

sealing flow between the outer surface of the collection tube and the inner surface of the sample vessel during movement of the collection tube into and out of the sample vessel; and

draining serum from the collection tube onto the barrier during removal of the collection tube from the sample vessel.

3,932,278

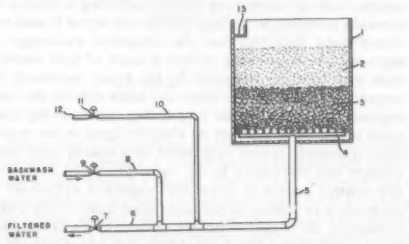
FILTER CLEANING METHOD

John A. Meidl, and Thomas J. Vollstedt, both of Schofield, Wis., assignors to Sterling Drug Inc., New York, N.Y.

Filed Feb. 15, 1974, Ser. No. 442,791

Int. Cl.² B01D *41/02*

U.S. Cl. 210—80 **4 Claims**



1. The method of backwashing sand or multi-media filters employed in wastewater treatment or sewage treatment plants in order to remove a coating therefrom, said coating consisting at least in part of activated carbon, which comprises contacting the filter media with water containing between about 50 and 500 ppm of chlorine for a period of between about 2 minutes and 1200 minutes, and backwashing the filter to remove the sloughed off coating.

4. The method of backwashing sand or multi-media filters employed in wastewater treatment or sewage treatment plants

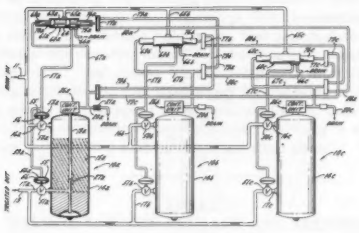
in order to remove a coating therefrom, said coating consisting at least in part of activated carbon, which comprises contacting the filter media with water containing between about 20 and 200 ppm of ozone for a period of between about 2 minutes and 1200 minutes, and backwashing the filter to remove the sloughed off coating.

3,932,279

MULTI-TANK ION EXCHANGE WATER TREATMENT SYSTEM

Charles H. Yocum, Roscoe, Ill., assignor to Rock Valley Water Conditioning, Inc., Rockford, Ill.

Division of Ser. No. 387,115, Aug. 9, 1973, Pat. No. 3,876,539. This application Oct. 11, 1974, Ser. No. 514,247
Int. Cl.² B01D *15/06*
U.S. Cl. 210—96 **2 Claims**



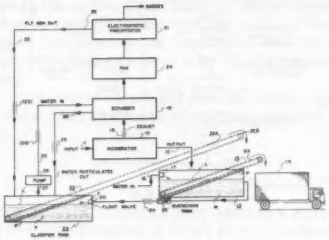
1. An ion exchange water treatment system comprising a plurality of ion exchangers adapted to be connected in parallel in a water system, an electric control circuit associated with all of said exchangers, said control circuit including a plurality of control branches and further including a plurality of energizing paths, there being one control branch and one energizing path associated individually with each exchanger, all of said control branches being connected in parallel with one another in said circuit and all of said energizing paths being connected in parallel combination with one another in said circuit, energizing means in each of said energizing paths, an electric sensing circuit associated individually with each exchanger and normally energized by the respective energizing means, each of said sensing circuits including a sensing means normally operable to produce an electric signal in said sensing circuit upon detecting that the respective exchanger needs regeneration, responding means in each of said sensing circuits and normally triggered by the signal produced by the respective sensing means when the latter detects the need for regeneration, each of said responding means being operable when triggered to produce an electric signal in the respective control branch, means associated individually with each exchanger and responsive to the signal produced in the respective control branch to cause the respective exchanger to regenerate, a switching device associated individually with each exchanger, all of said switching devices being connected in a series combination which is connected in series with the parallel combination of energizing paths, and means associated individually with each switching device for placing the respective switching device in a first condition when the exchanger begins regeneration and for placing the switching device in a second condition when the exchanger completes regeneration, the switching device of any one exchanger being operable when in said first condition to disable the energizing means for the sensing circuit of every other exchanger thereby to prevent the sensing means in every other sensing circuit from producing its signal so only one exchanger may regenerate at a time.

3,932,280

CLOSED WATER SYSTEM IN MUNICIPAL INCINERATION PLANTS

Grant L. Anderson, Ogden, Utah, assignor to Clear Air, Inc., Ogden, Utah

Filed Mar. 29, 1974, Ser. No. 456,227
Int. Cl.² B01D *21/24*
U.S. Cl. 210—119 **6 Claims**



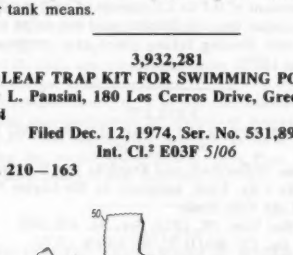
1. In the combination of an incinerator having a gases' exhaust means, a materials' input, and an incinerated materials' output, and a scrubber coupled to said exhaust means: an improvement comprising quenching tank means for receiving said output, clarifier tank means for introducing water into and receiving water and particulates from said scrubber, means for introducing water into said quenching tank means, first and second endless-belt conveyor structure means having lower ends disposed in said clarifier tank means and quenching tank means, respectively, for respectively conveying solely solids from said clarifier and quenching tank means, said first and second endless-belt conveyor structure means each including an upper flight terminating in an upper end, said upper flight of said first endless-belt conveyor structure means being constructed and arranged for discharge over said upper end thereof upon said upper flight of said second endless-belt conveyor structure means, and means for conducting water solely one way from said quenching tank means into said clarifier tank means.

3,932,281

LEAF TRAP KIT FOR SWIMMING POOLS

Andrew L. Pansini, 180 Los Cerros Drive, Greenbrae, Calif. 94904

Filed Dec. 12, 1974, Ser. No. 531,897
Int. Cl.² E03F *5/06*
U.S. Cl. 210—163 **4 Claims**



1. A swimming pool leaf trap comprising a perforate basket-shaped member placed in inverted position upon and in sealing and enclosing relation to the main drain opening plate of

a pool, and a dome-shaped housing in peripheral engagement with and supported by the pool floor in enclosing, spaced relation to said member and defining therewith a leaf entrapment and leaf storage space, an inlet opening formed in the side of the housing for the passage of leaves into the storage space under the influence of selective water circulation flow along a first path defined by said inlet opening, said member, and said drain opening plate, and an outlet opening formed in the top of the housing for the passage of leaves out of the storage space under the influence of alternatively selective water circulation flow along a second path defined by said housing inlet opening and said outlet opening.

3,932,282

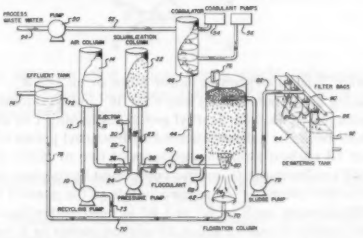
DISSOLVED AIR FLOATATION SYSTEM

Gregory A. Ettelt, Berwyn, Ill., assignor to Tenco Hydro/Aerosciences, Inc., Countryside, Ill.

Continuation of Ser. No. 286,220, Sept. 5, 1972, abandoned. This application Aug. 6, 1974, Ser. No. 495,229

Int. Cl.² B01D *17/00;* **B03D** *1/00*

U.S. Cl. 210—195 **5 Claims**



1. In a dissolved air flotation system, including means for making air charged water and means for combining waste and the air-charged water, the improvement comprising, in combination: a flotation column having a greater vertical height than width whereby it is suitable for vertical flotation; an inlet to said flotation column for carrying the combined waste and released bubbles from said air-charged water; a release well in said flotation column, means coupling said release well to said inlet, said release well permitting upward flotation of the combined waste and bubbles and operating to slow the flow and prevent breakage of the bubbles; a clarified water outlet at the lower portion of said flotation column to draw the clarified water uniformly from about the tank without localized drawoffs and structural obstructions, said outlet comprising a pipe defining openings on its circumference for passage of clarified water; and a plate member that is generally coaxial with said vertical flotation column; means connecting said plate member to the top of said pipe whereby passage of clarified water into said pipe can only be accomplished through said openings, said plate member having a substantially greater diameter than the diameter of said pipe.

3,932,283

FLUID EXCHANGE DEVICE

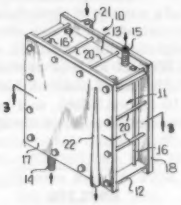
William G. Esmond, 537 Stamford Road, Baltimore, Md. 21229

Filed Apr. 13, 1971, Ser. No. 133,574

Int. Cl.² B01D *31/00*

U.S. Cl. 210—321 **2 Claims**

1. A fluid exchange device comprising a stack of alternating first and second flow plates, the opposite faces of said first flow plates being contoured to define first flow paths thereacross and opposite faces of said second flow plates having planar portions, each of said second flow plates being telescoped within a membrane sleeve with each membrane sleeve having remote portions clamped between adjacent first and second flow plates and deformable outwardly by fluid under pressure within each membrane sleeve partially into said first flow paths to define second flow paths between each membrane sleeve and a respective planar second flow plate face portion, means for flowing a first fluid through said first flow paths and a second flow fluid through said second flow paths,



said second flow plates having remote distribution and collection channels formed in the opposite faces thereof at opposite ends of said planar face portions, said distribution and collection channels being formed adjacent ends of said flow plates with flow of said second fluid being longitudinally of said flowplates, and said first paths being disposed transversely of said flow plates.

3,932,284

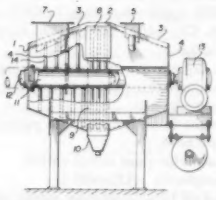
BARREL SHAPED MERCURY SEPARATOR WITH SPOKED AGITATOR

Fred Ellsworth Howe, Kimberley, Canada, assignor to Cominco Ltd., Vancouver, Canada

Filed Jan. 6, 1975, Ser. No. 538,728

Int. Cl.² B01D *21/01*

U.S. Cl. 210—523 **7 Claims**



1. Apparatus for separating mercury from mercury containing material comprising a closed horizontal generally barrel-shaped vessel, having opposed conical end sections and a central cylindrical section, and provided with ports for charging the vessel, and for discharging the mercury and the treated residue, agitating means comprising a rotatable spindle coaxially extending within said vessel, and provided with a plurality of spokes, said spokes being arranged in rows, said rows of spokes being parallel to each other and equally spaced along the length of the spindle, each row having at least four spokes equiangularly positioned about the circumference of the spindle, the spokes in each row being off-set from the spokes in the next row except for those in the central cylindrical section which are not off-set, said spokes being of equal length in each row, but of different lengths in different rows, such that a constant distance exists between the free ends of each of the spokes and the inner wall of the vessel.

3,932,285
CHROMIUM SALT COMPOSITIONS AND A PROCESS FOR THEIR PRODUCTION

Mario Q. Ceprini, Cedarhurst, N.Y., and Roy T. Gottesman, Glen Rock, N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Oct. 3, 1973, Ser. No. 403,319
Int. Cl.² C09K 3/00
U.S. Cl. 252—1 **32 Claims**

1. A stable solution containing at least 7.5% by weight of dissolved chromium that comprises an inert, water-insoluble organic solvent and a mixture of chromium salts that contains 20 to 80 mole percent of at least one chromium (III) salt of a straight-chain aliphatic monocarboxylic acid having 5 to 10 carbon atoms and 20 to 80 mole percent of at least one chromium (III) salt of a branched-chain aliphatic monocarboxylic acid having 5 to 10 carbon atoms, said branched-chain acid having branching at one or more of the alpha and beta positions of the chain.

3,932,286
ANTIFRICTION POLYMERIC MATERIAL AND A COMPOSITION THEREOF

Nikolai Ivanovich Pylaev, ulitsa Kontorskaya, 18, kv. 52, and Valery Yakovlevich Ponomarev, prospekt Metallistov, 82, kv. 82, both of, Leningrad, U.S.S.R.

Filed Jan. 21, 1975, Ser. No. 542,845
Int. Cl.² C10M 5/00, 7/00
U.S. Cl. 252—12.4 **7 Claims**

1. A composition for antifriction materials, comprising the following components, parts by weight:

epoxy binder	36 – 48
glass cloth or fibreglass	42 – 44
polytetrafluoroethylene of crystallinity 0.60	8 – 22.

3,932,287
REACTIVE COLD FORMING LUBRICANT

Horst Schneider, Frankfurt, Germany, assignor to Oxy Metal Industries Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 216,731, Jan. 10, 1972, abandoned. This application Aug. 7, 1974, Ser. No. 495,348
Int. Cl.² C10M 1/44, 3/38, 5/24, 7/24
U.S. Cl. 252—32.5 **14 Claims**

1. A stable organic phase coating composition useful for treating a metallic surface prior to non-cutting cold forming, consisting essentially of:

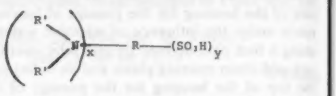
a. 5 to 60 weight % of the reaction product obtained upon mixing as reactants
   1. a salt of a multivalent metal cation,
   2. a polyphosphoric acid, and
   3. an alcohol of 10 – 36 carbon atoms, in a weight ratio of metallic cation: P_2O_5 equivalent: alcohol of 1: 3–60: 14–150;
b. 30 to 94 weight % of an organic lubricant of at least 12 carbon atoms; and
c. 0.5 to 10 weight % water.

3,932,288
AMINOSULFONIC ACID-HETEROCYCLO PROPANE-AMINE REACTION PRODUCTS AND FUELS AND LUBRICANTS CONTAINING SAME

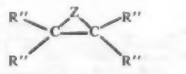
Donald Irvin Hoke, Chagrin Falls, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Filed July 29, 1974, Ser. No. 492,665
Int. Cl.² C10M 1/40, 3/34, 5/22, 7/38
U.S. Cl. 252—33 **12 Claims**

1. A lubricant composition comprising a major amount of lubricant and a minor but sludge dispersing and/or corrosion inhibitive amount of an additive composition made by reacting (A) at least one acylated amino hydrocarbyl sulfonic acid or Group I or II metal salt, or ammonium salt of C_{1-6} amine salt thereof, of at least (i) one amino hydrocarbyl sulfonic acid of the formula



wherein R is a hydrocarbyl group of one to about thirty carbon atoms having a valency of $x + y$, each R′ is independently a hydrogen atom or a monovalent hydrocarbyl group of one to about 18 carbon atoms, with the proviso that at least one R′ is a hydrogen atom, x and y are each independently 1 or 2 and $x + y$ is no more than 3, said acylated amino hydrocarbyl sulfonic acid having a (ii) carboxylic acid radical containing a substantially saturated hydrocarbyl substituent of at least about 12 carbon atoms and attached directly to an amino group of the amino hydrocarbyl sulfonic acid (i) through an acyl, acylimidoyl or acyloxy linkage; (B) at least one heterocyclic reagent selected from the group consisting of epoxides, episulfides and aziridines of the formula



wherein Z is an oxygen or sulfur atom or an —NR′— group, R′ being as defined in (A) and each R″ independently being a hydrogen atom, hydrocarbyl group containing 1 to about 18 carbon atoms or halo-substituted hydrocarbyl group of one to about 18 carbon atoms or mixtures of two or more of these; and (C) at least one (i) amino compound having one to about 400 carbon atoms or (ii) organo sulfide of the general formula R^4SR^5 wherein each of R^4 and R^5 is independently a hydrocarbyl group of one to about 50 carbon atoms or a hydroxyl-substituted hydrocarbyl group of 2 to about 50 carbon atoms and containing 1–6 hydroxyl groups with the proviso that R^4 and R^5 can be taken together with S to form a ring of 5 to 6 annular members.

3,932,289
PREPARATION OF OVERBASED CARBONATED SULFURIZED MAGNESIUM ALKYLPHENATES

John M. King, San Rafael, and Nicolaas Bakker, Pinole, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Nov. 9, 1973, Ser. No. 414,585
Int. Cl.² C10M 1/54
U.S. Cl. 252—42.7 **6 Claims**

1. A process for preparing an overbased sulfurized magnesium phenate which comprises:

a. forming a first mixture of a C_1 to C_3 magnesium alkoxide in a lower alkanol solvent and carbonating the mixture with 1.5 to 4 weight parts of carbon dioxide per weight part of magnesium;
b. contacting said carbonated first mixture with a C_8 to C_{28} alkylphenol at a temperature from about 20° to 150°C to form a normal magnesium phenate, the amount of alkylphenol contacted being 0.5 to 2 mols per mol of magnesium contacted;
c. contacting said normal magnesium phenate with 0.8 to 3.0 mols of sulfur per mol of alkylphenol in said normal magnesium phenate at a temperature of 130° to 250°C to form a sulfurized magnesium phenate and by-product hydrogen sulfide; and
d. contacting said sulfurized magnesium phenate with a sufficient amount of said carbonated first mixture to provide from 0.1 to 2.0 molar parts of carbonated magnesium alkoxide per molar part of alkylphenol in said sulfurized magnesium phenate, said contacting being conducted at a temperature from 20° to 120°C.

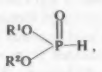
3,932,290

PHOSPHORUS-CONTAINING FRICTION MODIFIERS FOR FUNCTIONAL FLUIDS

Frederick William Koch, Willoughby Hills, and Jerry Lee Musser, Chardon, both of Ohio, assignors to The Lubrizol Corporation, Cleveland, Ohio

Filed Oct. 4, 1973, Ser. No. 403,373
Int. Cl.² C10M 1/10
U.S. Cl. 252—49.8 3 Claims

1. A functional fluid composition comprising a major amount of a lubricating oil and a minor friction-reducing amount of the product obtained by reacting, at a temperature above about 100°C. and below the decomposition temperature of the reaction mixture, and in the presence of a strongly alkaline reagent, at least one phosphorus compound of the formula



wherein each of R^1 and R^2 is a lower alkyl radical, with at least one epoxide of the formula

wherein R^3 is an alkyl radical having 10–20 carbon atoms; about 1.0–1.5 moles of said epoxide being present per mole of said phosphorus compound.

3,932,291

PREPARATION AND DOPING OF SEMICONDUCTING FORMS OF $CuAlS_2$

Paul C. Donohue, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Jan. 10, 1973, Ser. No. 322,359
Int. Cl.² C04B 35/00; H01B 1/10
U.S. Cl. 252—62.3 V 6 Claims

1. A semiconducting essentially colorless copper aluminum sulfide having chalcopyrite tetragonal structure having a light absorption coefficient less than 1.5×10^2 cm^{+1} at 4000A consisting of copper, aluminum and sulfur wherein the ratio of aluminum to copper lies between the range 1.001 and 1.01 and the ratio of sulfur to the sum of copper and aluminum lies between 0.975 and 0.995.

2. A process for producing a semiconducting essentially colorless copper aluminum sulfide having chalcopyrite tetragonal structure and a light absorption coefficient less than $1.5 \times 10^2 cm.^{+1}$ at 4000A which comprises heating in a closed system in the absence of air at a temperature range of 900°–1250°C. for 12 hours or more a mixture of elemental copper, aluminum and sulfur all of 99.999% purity in atomic weight ratios

a. Cu=0.98–1.0, Al=1.001–1.30, S=1.95–2.0;
b. Cu=0.98–0.99, Al=1.0–1.30, S=1.95–2.0; or
c. Cu=1.00, Al=1.00, S=1.95–1.99.

3,932,292

PROCESS FOR THE MANUFACTURE OF DOPED SILVER HALIDES

Pierre Junod, Fribourg, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Aug. 1, 1973, Ser. No. 384,667
Claims priority, application Switzerland, Aug. 17, 1972, 12194/72
Int. Cl.² C04B 35/00; H01L 3/00
U.S. Cl. 252—62.3 R 8 Claims

1. A process for the production of a homogeneously doped silver halide which comprises reacting doped silver inside a closed reaction vessel with the vapour of chlorine, bromine or iodine, said doped silver being so positioned that neither the doped silver nor the newly formed halide comes into contact with the walls of the reaction vessel, at a temperature below the melting temperature of the doped silver and above the melting temperature of the doped silver halide, and collecting the doped silver halide thus formed on a support under conditions so adjusted and controlled, that the doped silver halide is recovered in crystalline form, and wherein the ratio of dopant to silver is 0.1 to 100 parts of dopant per million parts of silver, and wherein the dopant is selected from the group consisting of bismuth, cadmium, gallium, indium, lithium, magnesium, nickel, lead, zinc, manganese, titanium, platinum, tin, iron, sulphur, gold and rhodium.

3,932,293

METALLIC FERROMAGNETIC PARTICLES FOR USE IN ENVIRONMENTALLY STABLE MAGNETIC RECORDING MEDIA

John S. Roden, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 255,260, May 22, 1972, Pat. No. 3,837,912. This application Aug. 28, 1974, Ser. No. 501,264
Int. Cl.² C09J 5/23
U.S. Cl. 252—62.55 7 Claims

1. Fine magnetizable particles useful in the magnetizable layer of a magnetic recording medium to provide magnetic recording characteristics of improved environmental stability, said particles comprising at least 75 weight-percent metal, at least a majority of which is iron, cobalt, or nickel, and having a thin outer layer that comprises a chromium- and oxygen-containing compound and is formed by exposing the particles under high-shear mixing conditions to a solution containing dichromate or chromate ions and having a pH of up to 7.0, the amount of chromium in said thin outer layer comprising between about 1 and 10 percent of the total weight of the particles.

3,932,294

FUNCTIONAL FLUID CONTAINING A HYDROLYSIS SUPPRESSOR

Merwyn L. Burrous, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 11, 1974, Ser. No. 432,712
Int. Cl.² C09K 50/00; C10M 1/10
U.S. Cl. 252—78 5 Claims

1. A functional fluid comprising an admixture of
1. a major portion of a base oil which is an organic ester or amide of a phosphorous acid, or mixtures thereof, and
2. a minor portion, from 0.01 to 8 weight percent of said fluid, of at least one 2-(3,4-epoxycycloalkyl)-5-5′-spiro-(3,4-epoxy)cycloalkyl-m-dioxane having from 15 to 45 carbon atoms.

3,932,295

DETERGENT COMPOSITION

Takashi Fujino, Yokohama, and Riyouichi Matsui, Sakura, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1974, Ser. No. 465,066
Int. Cl.² C11D 7/54
U.S. Cl. 252—102 3 Claims

1. A bleaching detergent composition consisting essentially of an anionic or nonionic textile-washing surfactant; from 1 to 50% by weight of sodium percarbonate; and a polymer selected from the group consisting of polyethylene glycol having a molecular weight in the range of 4000 to 20000, polyvinylpyrrolidone having a molecular weight in the range of 40000 to 360000, and mixtures thereof, the amount of said polymer being from 0.01 to 10 times the amount of sodium percarbonate, whereby the composition in aqueous solution is effective to remove soil from textiles and bleach the textiles and said polymer is effective to reduce migration of dyestuffs from colored textiles to white textiles present in the same washing bath.

3,932,296

CORROSION INHIBITOR

Nancy J. Byth, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 29, 1973, Ser. No. 364,385
Int. Cl.² C11D 7/32, 7/08; C23G 1/06; C23F 11/14
U.S. Cl. 252—148 5 Claims

1. A corrosion inhibitor comprising:

a. the reaction product of about 1 mole of an organic ammonia derivative containing at least one active hydrogen attached to the nitrogen atom per molecule; from about 1.5 to about 10 moles of a ketone having at least one hydrogen atom attached to the carbon atom alpha to the carbonyl group, from about 2 to about 10 moles of an aldehyde; from about 0.3 to about 24 parts by weight, based on the other four reactants of a fatty acid containing from 1 to about 20 carbon atoms and from about 0.005 to about 0.10 mole of a first quaternary ammonium compound, in admixture with,

b. from about 0.5 to about 10 parts by volume of a secondary quaternary ammonium which is different from the first quaternary ammonium compound.

3,932,297

SOLVENT COMPOSITIONS FOR CLEANING

John Joseph Clementson, and Arisztid Lajos Horvath, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 14, 1974, Ser. No. 433,403
Claims priority, application United Kingdom, Feb. 2, 1973, 5238/73
Int. Cl.² C11D 3/43
U.S. Cl. 252—171 3 Claims

1. An azeotropic composition consisting essentially of 1,1,1-trichloroethane and n-propanol wherein the proportion of n-propanol is 7.1% by weight of the composition, said composition having a boiling point of 72.3°C.

3,932,298

NEMATIC LIQUID CRYSTALS WITH CHARGE-TRANSFER ACCEPTORS AS DOPANTS

Mortimer M. Labes, Philadelphia, Pa., assignor to Temple University, Philadelphia, Pa.

Filed July 19, 1973, Ser. No. 380,817
Int. Cl.² G02F 1/16
U.S. Cl. 252—299 6 Claims

1. A nematic liquid crystal composition consisting essentially of (a) a nematic liquid selected from the group consisting of azoxy, azo, ethylenic and acetylenic linked dibenzenes, substituted at the para positions with substituents selected from the group consisting of lower alkyls and lower alkoxies and (b) a nonionic charge-transfer acceptor dopant selected from the group consisting of a tetra halo-p-benzoquinone, chloranil, 2,3-dichloro-5,6-dicyano-p-benzoquinone, and 7,7,8,8-tetracyanoquinodimethane.

3,932,299

METHOD FOR THE REDUCTION OF IRON IN IRON-DOPED LITHIUM NIOBATE CRYSTALS

William Phillips, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 302,185, Oct. 30, 1972, abandoned. This application Dec. 3, 1973, Ser. No. 420,784
Int. Cl.² G11C 17/00
U.S. Cl. 252—300 8 Claims

1. A method of reducing over 90 percent of the trivalent iron present in an iron-doped lithium niobate crystal to divalent iron without reducing the lithium niobate which comprises surrounding an iron-doped lithium niobate crystal in a salt of lithium and heating at a temperature of at least about 400°C up to about 1000°C but below the melting point of said lithium salt in an oxygen-containing atmosphere.

3,932,300

SYSTEM FOR DISPOSING OF RADIOACTIVE WATER

Reginald L. Gotchy, Bethesda, Md., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 10, 1973, Ser. No. 395,677
Int. Cl.² G21F 9/02
U.S. Cl. 252—301.1 W 6 Claims

1. A method for reducing the amount of radioactivity released to the biosphere in connection with the production of gas from a nuclearly stimulated natural gas reservoir created in natural gas bearing strata comprising the steps of:

a. transporting the gaseous mixture including hydrocarbons, water vapor and entrained liquid water from a nuclearly created chimney in said reservoir to the earth's surface through an annulus formed between a pair of conduits, the first of which is positioned within the second,

b. separating water from said gaseous mixture, and

c. injecting the water separated from said gaseous mixture into a nuclearly created chimney through an inner of a pair of conduits, the first of which is positioned within the second, which inner conduit extends further into the chimney than the other of said pair whereby said injected water enters the chimney at a lower level than that from which the gaseous mixture of that chimney is received by the annulus between the pair of conduits for transportation to the earth's surface and said downwardly flowing water provides precooling to said upwardly flowing gaseous mixture.

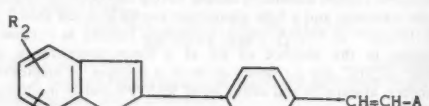
3,932,301

STILBENE OPTICAL BRIGHTENERS AND COMPOSITIONS BRIGHTENED THEREWITH

Nathan N. Crounse, and Kantilal B. Desai, both of Cincinnati, Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 118,076, Feb. 23, 1971, Pat. No. 3,781,279. This application May 29, 1973, Ser. No. 364,248
Int. Cl.² D06L 3/12
U.S. Cl. 252—301.2 W 4 Claims

1. A normally solid, fiber and film-forming polyester or nylon polymeric material having incorporated therein approximately 0.005 to 0.5 percent by weight of said polymeric material of a fluorescent compound of the formula



wherein R_1 is hydrogen, alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, or halo; R_2 and R_3 are the same or different and are members of the class consisting of H, alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, halo, dialkylamino wherein each alkyl has 1 to 6 carbon atoms, alkanoylamino having 1 to 6 carbon atoms, phenyl, phenyl substituted by alkyl having 1 to 6 carbon atoms, halo, alkoxy having 1 to 6 carbon atoms, and alkanoylamino having 1 to 6 carbon atoms; and A is a monovalent aromatic radical selected from the class consisting of 9-phenanthrenyl, 9-anthryl, 2-benzofuranyl, 2-indolyl, 2-benzothiophenyl, 3-coumarinyl, 2-indenyl, 2-quinolinyl, 3-quinolynyl, 2benzoxazolyl, 2-benzothiazolyl, 2-naphtho[2,1-b]furanyl and 2-naphtho[1,2-b]furanyl.

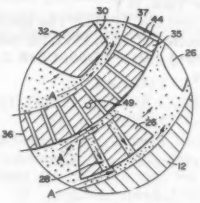
3,932,302
FOAM GENERATOR

Robert E. Eron, 3375 34th St. North, St. Petersburg, Fla. 33714

Continuation-in-part of Ser. No. 96,105, Dec. 8, 1970, Pat. No. 3,791,778, which is a continuation-in-part of Ser. No. 771,704, Oct. 30, 1968, abandoned. This application Jan. 21, 1974, Ser. No. 434,797

Int. Cl.² B01J 13/00

U.S. Cl. 252—359 E 2 Claims



1. A foam generator and pump constructed to produce a foamed discharge, said foam generator and pump comprising: a housing having at least one inlet for introducing fluid and for introducing a foaming solution into said housing; at least one outlet means for discharging foam; agitating means movably mounted within said housing; said agitating means comprising a pair of eccentric but co-planar rotors including one inner rotor and one outer rotor; each of said rotors having teeth formed thereon and said outer rotor arranged in cooperative substantially surrounding relation to said inner rotor, said inner and outer rotors being externally and internally geared respectively in intermeshing engagement during only a portion of their relative movement; a partition positioned between said rotors in the area where said rotors are not in intermeshing engagement; said partition including a plurality of bores formed therethrough for transmitting a foam solution between the gear pockets and the teeth of said rotors; said bores comprising at least one radial partition bore and at least one axial inlet partition bore; said radial bores being formed in cooperative relation between the gear pockets and between the teeth of said inner and outer rotors, whereby foam is generated by the interaction of fluid and foaming solution with said gear pockets, said teeth and said bores, said axial partition bore providing means for extraneous chemical input.

3,932,303
CORROSION INHIBITION WITH TRIETHANOLAMINE PHOSPHATE ESTER COMPOSITIONS

William Robert Hollingshad, Bethel Park, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed June 4, 1973, Ser. No. 367,079

Int. Cl.² C23F 11/16, 11/14

U.S. Cl. 252—389 A 10 Claims

1. A composition useful for inhibiting the corrosion of metals in a water system which comprises a triethanolamine phosphate ester and at least one member selected from the group consisting of phosphoric acid, phosphonates, and a polyacrylate having a molecular weight of from about 500 to about 10,000.

3,932,304
METHOD FOR FORMING A CATALYTIC DEPOSIT

Claude Lambert, St-Michel-sur-Orge; Pierre Bono, Morangis; Bernadette Pichon, Velizy, and Jacques Daunay, Versailles, all of France, assignors to Societe Generale de Constructions Electriques et Mecaniques Alsthom & Cie, Paris, France

Filed Apr. 4, 1974, Ser. No. 457,843

Claims priority, application France, Apr. 16, 1973, 73.13728

Int. Cl.² B01J 21/18; H01M 4/08, 4/96; H01B 1/04

U.S. Cl. 252—428 6 Claims

1. A method for producing a catalytic carbon deposit on a conductive support comprising

admixing (i) a suspension of between 200 and 400 grams per liter of catalytic carbon in a liquid medium from the group consisting of water and alcohol, with (ii) a solution of between 20 and 50 grams per liter of polyvinyl chloride in a cyclic ketone solvent, to form an emulsion,

depositing said emulsion on said support, and

evaporating the liquid components of said emulsion from said support to form a layer of catalytic carbon in a polyvinyl chloride binder.

3,932,305
V-P-ZR CATALYSTS AND METHOD OF PREPARATION THEREOF IN THE ABSENCE OF HYDROGEN HALIDE

Anthony T. Jurewicz, and Lewis Brewster Young, both of Kendall Park, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 17, 1974, Ser. No. 461,668

Int. Cl.² B01J 27/18

U.S. Cl. 252—429 R 5 Claims

1. A method for preparing a vanadium-phosphorus-zirconium catalyst composite that consists essentially of:

a forming an aqueous mixture of a vanadium compound selected from the group consisting of V_2O_5, $VOCl_3$, $VO(NO_3)_3$, NH_4VO_3, and VF_5 and a reactant selected from the group consisting of hydroxy-alkanoic acids having 2–3 carbon atoms and oxo-alkanoic acids having 2–3 carbon atoms in a ratio of said reactant to vanadium compound of between about 0.05 and about 1, refluxing said mixture for between about 0.5 hour and 5 hours;

b adding a zirconium salt selected from the group consisting of $ZrOCl_2 \cdot 4H_2O$, $ZrOCl_2 \cdot 8H_2O$, $ZrO(OAc)_2 \cdot H_2O$, $ZrCl_4$, $Zr(OAc)_4$, Na_2ZrCl_6, and $ZrOBr_2 \cdot xH_2O$, in a Zr/V atomic ratio of between about 0.0025 and about 0.5, continuing refluxing for between about 0.5 hour and about 5 hours;

c adding phosphoric acid or a compound hydrolyzable to phosphoric acid, in a P/V atomic ratio of between about 1.1/1 and about 1.5/1, continuing refluxing for between about 0.5 hour and about 5 hours to form a slurry; and

d drying said slurry.

3,932,306
SOLID CATALYST FOR HETEROGENEOUS REACTIONS

Peter Rona, Haifa, Israel, assignor to IMI (TAMI) Institute for Research & Development, Haifa, Israel

Filed Jan. 4, 1974, Ser. No. 431,010

Claims priority, application Israel, Jan. 17, 1973, 41329

Int. Cl.² B01J 31/02

U.S. Cl. 252—430 9 Claims

1. A composite solid catalyst for heterogeneous catalytic chemical reactions, produced by a process consisting essentially of the following steps:

a. impregnating an inert carrier with carboxymethane sulfonic acid, a precursor thereof or precursors thereof which form carboxymethane sulfonic acid on heating;

b. drying the so-impregnated carrier, at a temperature not exceeding 170°C, to remove volatiles; and

c. baking the product of step (b) at a temperature within the range of 170°–330°C to constant weight.

3,932,307
TETRA(NEOPHYL) ZIRCONIUM AND ITS USE IN PROCESS FOR THE POLYMERIZATION OF OLEFINS

Robert Alton Setterquist, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 20, 1974, Ser. No. 471,813
Int. Cl.² B01J 31/12
U.S. Cl. 252—430 8 Claims

1. An olefin polymerization catalyst consisting essentially of the reaction product obtained by contacting a solution in hydrocarbon medium of tetra(neophyl) zirconium with a suspension in hydrocarbon medium of a hydroxylated metal oxide free from absorbed molecular H_2O of a metal selected from the group consisting of the metals of Groups II(a), III(a), IV(a), and IV(b) of the Bohr Periodic Table of the Elements, the proportion of said tetra(neophyl) zirconium being at least 0.05 millimoles per gram of oxide.

3,932,308
HYDROGENATION CATALYST

Fredrick C. Loveless, Oakland, N.J., and Don H. Miller, Warren, Mich., assignors to Uniroyal Inc., New York, N.Y.

Division of Ser. No. 224,977, Feb. 9, 1972, Pat. No. 3,855,185.
This application Oct. 9, 1974, Ser. No. 513,373
Int. Cl.² C07C 5/02
U.S. Cl. 252—431 R 15 Claims

1. A method of making a hydrogenation catalyst comprising in combination the steps of:

A. forming a hydrocarbon-soluble organometallic complex by contacting, in a hydrocarbon solvent medium,

a. an organic chelate compound of a transition metal selected from the group consisting of nickel, cobalt and iron with a chelating agent selected from the group consisting of beta-diketone and beta-ketoester, with

b. a phenolic substance selected from the group consisting of phenol, 2-alkylphenol, 4-alkylphenol, 2,4-dialkylphenol and 2,6-dialkylphenol wherein each alkyl group contains 1 to 10 carbon atoms,

the amount of (a) being from ½ to 2 moles, per mole of (b); and thereafter

B. mixing the resulting solution of hydrocarbon-soluble organometallic complex provided in step (A) with

c. an organometallic reducing agent of the formula MR_n where M is a metal selected from the group consisting of lithium, magnesium and aluminum, R is a hydrocarbon radical selected from the group consisting of saturated acyclic hydrocarbon radical having 5 to 12 carbon atoms and aromatic hydrocarbon radical having 6 to 12 carbon atoms, and n is the valence of the metal M,

the amount of (c) being from 1 to 5 moles per combined moles of said organic chelate compound (a) plus said phenolic substance (b), whereby the said hydrogenation catalyst is produced in highly active form.

3,932,309
AUTO EXHAUST CATALYSTS PREPARED FROM SULFITE TREATED PLATINUM AND PALLADIUM SALT SOLUTIONS

James Richard Graham, Columbia; Michael Vance Ernest, Baltimore, and James Michael Maselli, Ellicott City, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed June 5, 1974, Ser. No. 476,505
Int. Cl.² B01J 27/02
U.S. Cl. 252—439 6 Claims

1. A process for preparing an auto exhaust conversion catalyst characterized by substantially improved conversion of carbon monoxide and hydrocarbons consisting essentially of the following steps:

a. preparing a solution from a platinum, palladium or platinum-palladium complex salt having the formula $M_4(X)(SO_3)_4$ or $M_2(X)(SO_3)_2$ wherein M is Na+, NH_4+ or H+ and X is platinum, palladium or a mixture of platinum and palladium,

b. impregnating a base selected from the group consisting of alumina, silica-alumina, mullite, cordierite and zirconia with said solution,

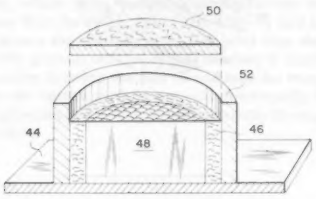
c. drying and activating by heating in air at a temperature of 800° to 1400°F. for 1 to 4 hours or in a reducing environment at a temperature of 600° to 800°F. for 0.5 to 2 hours, and

d. recovering the catalyst product.

3,932,310
REDUCTION FIRING OF CERAMICS COMPOSITED WITH ORGANIC BINDERS

Gordon James Turner, Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Mar. 7, 1974, Ser. No. 449,113. The portion of the term of this patent subsequent to Oct. 8, 1991, has been disclaimed.
Int. Cl.² B01J 29/06, 35/00; C04B 21/06
U.S. Cl. 252—455 R 3 Claims



1. In a process for preparing a porous ceramic structures by:

a. mixing a ceramic powder component with a high molecular weight polyolefin having a molecular weight of about 160,000 to 250,000 and a mineral oil plasticizer,

b. molding said composition to form a plastic sheet and impressing ribs thereon,

c. extracting the plasticizer with an organic solvent,

d. rolling said plastic sheet so that said ribs contact said sheet and fusing the contacting areas together thermoplastically,

the improvement comprising,

1. increasing the temperature of the body at a rate of about 100° to 300°C. per hour until a temperature of about 800°C. is reached, in fuel air mixture containing 0.5 to 10 volume percent excess fuel over the stoichiometric amount required for combustion, to burn off the polyolefin and,

2. increasing the temperature to about 1000°C. to 1600°C. in the presence of about 30% excess of the amount of air required for complete combustion and maintaining the temperature at 1000° to 1600°C. for abut 2 hours to sinter the ceramic component and,

3. cooling and recovering the porous ceramic structure.

3,932,311
ELECTRICALLY CONDUCTING ADHESIVE COMPOSITION

John R. Caldwell, and James Maynard Hawkins, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 29, 1974, Ser. No. 492,794
Int. Cl.² H01B 1/02
U.S. Cl. 252—514 8 Claims

1. Adhesive composition comprising

a. crosslinked polymer particles having a glass transition temperature below about 30°C. selected from polymers of alkyl acrylate, alkyl methacrylate, copolymers of alkyl acrylate and alkyl methacrylate and mixtures thereof,

said crosslinked polymer particles being present in the amount of about 35–55 weight percent;

b. electrically clean silver particles of 1 to 100 microns in the amount of 45–65 weight percent;

c. a suspending agent in the amount of 0.5 to 5.0 weight percent, said suspending agent being a particulate, insoluble inorganic compound having a particle size less than about 2 microns;

d. an organic solvent selected from acetone, methyl ethyl ketone, diethyl ketone, methyl butyl ketone, methyl isobutyl ketone, methylene chloride, trichloroethane, trichloroethylene, chloroform, methyl acetate, methyl formate, ethyl acetate, n-butyl acetate isobutyl acetate, benzene, toluene, chlorobenzene and mixtures thereof, and

e. said polymer particles, electrically clean silver powder, and suspending agent being disposed in said organic solvent in the amount of about 30 to 50 percent solids.

3,932,312

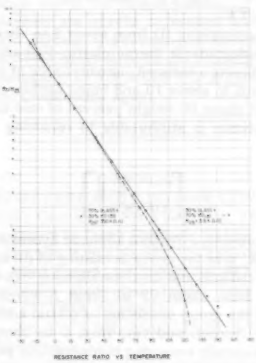
CONSTANT TEMPERATURE COEFFICIENT THICK FILM THERMISTOR

Casimir W. Kazmierowicz, Mission Viejo, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 1, 1974, Ser. No. 456,792

Int. Cl.² H01B *1/08*

U.S. Cl. 252—518 **10 Claims**



RESISTANCE RATIO VS TEMPERATURE

1. A thermistor material composition comprising 30–80% by weight VO_x where X varies from 1.5 to 1.9, and 70–20% by weight of glass.

3,932,313

PROCESS FOR MANUFACTURE OF POSITIVE TEMPERATURE COEFFICIENT MATERIALS

Thomas G. Reynolds, Woodstock, N.Y., and Oscar A. Nietzel, Dedham, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 28, 1973, Ser. No. 429,441

Int. Cl.² H01B *1/08*

U.S. Cl. 252—520 **14 Claims**

1. A process for preparing a positive temperature coefficient material selected from the group consisting of the titanates and zirconates of divalent cations selected from the group consisting of barium, calcium, strontium, lead, and tin comprising the steps of:

preparing a feed mixture comprising water, a compound of said divalent cation pyrolyzable in an oxidizing atmosphere to yield an oxide of said divalent cation, and an anion precursor compound selected from the group consisting of organic titanium lactate and acetate compounds and organic zirconium lactate and acetate compounds or mixtures thereof;

introducing said feed mixture into an anterior zone adjacent a reaction zone;

advancing said feed mixture from said anterior zone into said reaction zone;

heating said advancing feed material at the entrance to said reaction zone to a temperature sufficient to form at the entrance of said reaction zone a mass which swells, dehydrates and ignites;

breaking particles away from said mass at the entrance to said reaction zone to enter the reaction zone;

passing said particles through said reaction zone at a selected rate while heating said particles in an oxidizing atmosphere in the reaction zone at a temperature of at least about 800°C. sufficient to calcine said particles as rhe particles are passed through the reaction zone thereby to produce said positive temperature coefficient material;

milling said particles and said material in said reaction zone; and

discharging the product material from the reaction zone.

3,932,314

HEXABORIDE ELECTRON EMISSIVE MATERIAL

Ushio Kawabe, Hamura; Shigehiko Yamamoto, Tokorozawa; Toshiyuki Aita, Kokubunji, and Yukio Honda, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 5, 1974, Ser. No. 503,471

Claims priority, application Japan, Sept. 5, 1973, 48-99231

Int. Cl.² H01B *1/06*

U.S. Cl. 252—521 **6 Claims**

1. An electron emissive material which has a calcium hexaboride type crystal structure and which is represented by a general formula of $(Y_{1-x}Eu_x)B_6$ where $0<x<1$.

3,932,315

SUPERCONDUCTIVE BARIUM-LEAD-BISMUTH OXIDES

Arthur W. Sleight, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Sept. 24, 1974, Ser. No. 508,887

Int. Cl.² H01B *1/06*; H01C *8/00*

U.S. Cl. 252—521 **5 Claims**

1. Compositions of the formula $Ba_{1-x}A_xPb_{1-y}Bi_yO_3$ where

A is Na, K, Rb, Cs, Sr or Pb,

x is 0 to 0.5,

y is 0.05–0.3 with the proviso that x is equal to or less than y when A is Na, K, Rb or Cs.

3,932,316

FREE FLOWING DETERGENT COMPOSITIONS CONTAINING BENZOATE SALTS

John A. Sagel, Mount Healthy, Ohio, and Clarence Edward Weber, Cold Spring, Ky., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 13, 1974, Ser. No. 523,391

Int. Cl.² C11D *3/08*, *3/10*, *3/20*, *11/02*

U.S. Cl. 252—532 **9 Claims**

1. A non-phosphate, non-calcium carbonate-containing spray dried granular detergent composition comprising:

a. from 5 to 90% by weight of a water-soluble detergency builder;

b. from 5 to 50% by weight of an organic watersoluble synthetic detergent selected from the group consisting of anionic, nonionic, zwitterionic, and ampholytic detergents and mixtures thereof; and

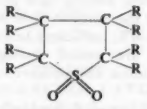
c. from about 0.10 to about 13.0% by weight of a salt of benzoic acid.

3,932,317
COMPOSITIONS FOR REMOVING ACRYLIC BASED COATINGS

Ralph P. Williams, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

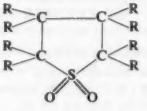
Filed Sept. 17, 1973, Ser. No. 398,063
Int. Cl.² C11D 1/58, 1/755, 7/32
U.S. Cl. 252—541 **4 Claims**

1. A composition useful for dilution with water to remove acrylic based coating compositions which comprises from about 5–25% by weight of concentrated aqueous ammonia, from 1 to 2% by weight of an organic surface active agent, from 0–1% by weight of an inorganic alkaline salt and from about 70–93% by weight of a sulfolane compound having the formula:



wherein each R is hydrogen or alkyl of 1 to 2 carbon atoms or alkoxy of 1 to 2 carbon atoms and wherein at least five of the R groups are hydrogen.

3. A method of removing acrylic based coating compositions which comprises contacting said acrylic based coating compositions with an aqueous solution of a composition comprising from about 5–25% by weight of concentrated aqueous ammonia, from 1 to 2% by weight of an organic surface active agent, from 0–1% by weight of an inorganic alkaline salt and from about 70–93% by weight of a sulfolane compound having the formula:



wherein each R is hydrogen or alkyl of 1 to 2 carbon atoms or alkoxy of 1 to 2 carbon atoms and wherein at least five of the R groups are hydrogen.

3,932,318
CHLORAL COPOLYMERS

Otto F. Vogl, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 352,387, April 18, 1973, which is a division of Ser. No. 227,684, Feb. 18, 1972, Pat. No. 3,775,371, which is a division of Ser. No. 886,739, Dec. 19, 1969, Pat. No. 3,668,184, which is a continuation-in-part of Ser. No. 731,622, May 23, 1968, abandoned, which is a continuation-in-part of Ser. Nos. 580,217, Sept. 19, 1966, abandoned, and Ser. No. 558,631, June 20, 1966, abandoned.
This application Dec. 6, 1974, Ser. No. 530,438
Int. Cl.² C08J 9/00; C08G 6/00, 2/18
U.S. Cl. 260—2.5 F **31 Claims**

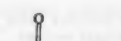
1. An addition copolymer of chloral and at least one comonomer selected from the group consisting of

$$R^3-N=C=X \text{ and } X=C=N-R^4-N=C=X$$

wherein

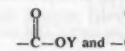
X is selected from the group consisting of oxygen and sulfur;

R^3 is selected from the group consisting of nonsubstituted alkyl and cylcoalkyl of up to 18 carbons, aryl of 6–18 carbons, and alkaryl and aralkyl of 7–24 carbons, substitution being selected from the group consisting of nitro, cyano, phenylazo, and $-NY_2$, $-OY$, $-SY$,



in which Y is lower alkyl or phenyl; and

R^4 is selected from the group consisting of nonsubstituted and substituted alkylene, alkarylene, aralkylene, cycloalkylene, alkylenebis(cycloalkylene), alkylenebis(arylene), arylene, arylenebis(alkylene) of up to 18 carbons and anthraquinonylene, any substitution being selected from the group consisting of fluorine, chlorine, bromine, iodine, nitro, cyano, phenylazo, and $-NY_2$, $-OY$, $-SY$,



in which Y is lower alkyl or phenyl, the copolymer containing from 1 to 99.9 mole percent of chloral.

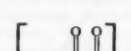
8. A copolymer of claim **1** in the form of a foam.

3,932,319
BLENDS OF A BIODEGRADABLE THERMOPLASTIC DIALKANOYL POLYMER, A NATURALLY OCCURRING BIODEGRADABLE PRODUCT, A PLASTIC ADDITIVE AND A FILLER

Robert A. Clendinning, New Providence; James E. Potts, Millington, and Walter D. Niegisch, Watchung, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 275,973, July 28, 1972, Pat. No. 3,850,862. This application July 15, 1974, Ser. No. 488,494
Int. Cl.² C08L 67/02
U.S. Cl. 260—7.5 **30 Claims**

1. A blend comprising (i) from about 5 to about 95 weight percent of biodegradable thermoplastic dialkanoyl polymer, said polymer having a reduced viscosity value of at least about 0.1 and upwards to about 10 and being further characterized in that at least about 10 weight percent of said thermoplastic dialkanoyl polymer is attributable to recurring units of the formula



wherein R represents a divalent aliphatic hydrocarbon radical, and wherein R′ is of the group consisting of divalent aliphatic hydrocarbon radicals and divalent aliphatic oxa-hydrocarbon radicals, (ii) from about 95 to about 5 weight percent of substances of the group consisting of plastic additives, fillers, and mixtures thereof, and (iii) from 0 to about 90 weight percent of a naturally occurring biodegradable product; based on the total weight of said blend.

3,932,320
POWDER PAINTS CONTAINING PARTICULATE METAL II

Melville J. Camelon, Utica, and Rodney C. Gibeau, Mount Clemens, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 422,471, Dec. 6, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,490
Int. Cl.² C08K 3/08, 9/04, 9/10
U.S. Cl. 260—17 R **11 Claims**

1. In a powder paint which exclusive of catalysts, antistatic agents, plasticizers, and flow control agent, the same being known and optional additives to powder paints, consists essentially of aluminum flakes, non-metal pigment, and a particulate, organic, film-former, the improvement wherein

A. non-metal pigment comprises 0 to about 22 weight percent of said powder paint,

B. said aluminum flakes comprise about 0.005 to about 25 weight percent of said powder paint and are encapsulated prior to admixture with said particulate, organic, film-former with about 2 to about 200 parts by weight of a

continuous coating of a thermoplastic, organic film-former per 100 parts by weight aluminum flakes, said thermoplastic, organic, film-former consisting essentially of thermoplastic, organic, film-formers selected from the group consisting of

1 polymers of alpha-beta olefinically unsaturated monomers of which about 51 to about 100 weight percent are acrylic monomers and 0 to about 49 weight percent are monovinyl hydrocarbons,
2 polyamides,
3 polyesters,
4 homopolymers of monovinyl hydrocarbons,
5 cellulose acetate,
6 cellulose butyrate, and

C. said particulate, organic film-former is selected from the group consisting of

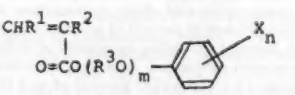
1 a thermoplastic, particulate, film-former that is a copolymer of alpha-beta olefinically unsaturated monomers of which about 51 to about 100 weight percent are acrylic monomers and 0 to about 49 weight percent are C_8 - C_{12} monovinyl hydrocarbons, and
2 a thermosettable, particulate, film-former consisting essentially of a copolymer having average molecular weight (M_n) in the range of about 1500 to about 15,000 and glass transition temperature in the range of about 40°C. to about 90°C. bearing functional groups provided by constituent monomers selected from the group consisting of glycidyl esters of a monoethylenically unsaturated carboxylic acid, C_3 - C_7 monohydroxy acrylates, C_3 - C_7 monohydroxy methacrylates and alpha-beta olefinically unsaturated amides and wherein at least above 50 weight percent of the constituent monomers are acrylic monomers and the remainder weight percent, if any, consists essentially of C_8 - C_{12} monovinyl hydrocarbons, said copolymer being self-crosslinkable or employed with a monomeric or polymeric crosslinking agent.

3,932,321
FLAME-RETARDANT POLYMER COMPOSITION

Hirohisa Maki, Osaka, and Yozo Kitagawa, Yokkaichi, both of Japan, assignors to Japan Synthetic Rubber Company Limited and Dai-Ichi Kogyo Seyaku Co. Ltd., both of, Japan

Filed June 6, 1974, Ser. No. 477,024
Claims priority, application Japan, June 18, 1973, 48-68461; June 18, 1973, 48-68462
Int. Cl.² C08L *23/00, 33/04, 67/06*
U.S. Cl. 260—17.4 R **7 Claims**

1. A flame-retardant polymer composition comprising a flame-retardant polymer and a different kind of a polymer, the amount incorporated of the flame-retardant polymer being 2 to 50 percent by weight based on the different polymer and said flame-retardant polymer being prepared by copolymerizing 2 to 100 percent by weight of a monomer represented by the following general formula (A)



(A),

wherein R^1 and R^2 stand for H or CH_3, R^3 is a linear or branched alkylene group having 2 to 6 carbon atoms which may be substituted by a hydroxyl group, X designates BR or Cl, n is a number of from 3 to 5, and m is a number of from 0 to 1,

with 98 to 0 percent by weight of at least one unsaturated compound copolymerizable with the monomer (A) selected from the group consisting of:

halogenated olefins,
halogenated vinyl aromatic compounds,
halogenated vinyl esters of carboxylic acids,
halogenated conjugated dienes,
nitrogen containing unsaturated compounds, and phosphorous-containing unsaturated compounds, and wherein the different polymer into which the flame-retardant polymer is incorporated is at least one member selected from the group consisting of polypropylene, polystyrene, ABS resins, acrylic resins, polyester resins, polycarbonate resins, phenol resins, unsaturated polyester resins, epoxy resins, cellulose resins, styrene-butadiene rubbers, acrylonitrile-butadiene rubbers, polybutadiene rubbers, polyisoprene rubbers, ethylene-propylene rubbers, butyl rubbers, polychloroprene rubbers, acrylic rubbers and epichlorohydrin rubbers.

3,932,322
WATER ABSORBING STARCH-ACRYLONITRILE GRAFT COPOLYMERS FUMED SILICA OR ALUMINA MODIFIED TO IMPROVE RATE OF ABSORPTION FOR PHYSIOLOGICAL FLUIDS

David V. Duchane, Ann Arbor, Mich., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 7, 1975, Ser. No. 556,267
Int. Cl.² C08L *3/00*
U.S. Cl. 260—17.4 GC **4 Claims**

1. An improvement in the composition of particulate, water-insoluble alkali metal carboxylate salts of starch-acrylonitrile graft copolymers of the type which are produced by saponifying a starch-acrylonitrile graft copolymer with an alkali metal base in an aqueous alcoholic medium and which particulate copolymer in its unimproved form is capable of absorbing in excess of 50 parts by weight of aqueous fluids per part of copolymer, and in which the molar ratio of the acrylonitrile to the starch in the graft copolymers is in the range of 2:1 to 30:1; said improvement comprising modifying said particulate copolymer by mixing therewith a minor quantity of a fumed oxide selected from the group consisting of fumed silica or fumed alumina in an amount sufficient to increase the rate at which said modified copolymer absorbs saline physiological fluids as compared to the rate at which said unimproved copolymer absorbs said fluids without reducing significantly the total absorbent capacity otherwise exhibited by said unimproved copolymer while minimizing the tendency of said copolymer to dust.

3,932,323
SELECTIVE ADDITION OF ADDITIVES TO SOLID POLYMER

Robert J. Perry, Houston, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 10, 1973, Ser. No. 358,891
Int. Cl.² C08L *23/06*
U.S. Cl. 260—23 H **9 Claims**

1. A method of additive addition to finely divided solid polymer wherein said polymer is a polyolefin having a bulk density of from about 8 to 22 pounds per cubic foot and wherein at least one additive is softened or melted at the blending temperature and at least one additive remains solid at the blending temperature and said blending temperature is below the melting point of said solid polymer comprising:

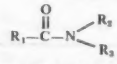
first, adding the additives which melt or soften below said blending temperature and blending the resultant mixture; and
subsequently adding the additives which are solid at the blending temperature and blending the resultant mixture.

3,932,324
LIGHT STABILIZER COMPOSITIONS FOR POLYMERS

Joseph Anthony Stretanski, Clinton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed June 13, 1974, Ser. No. 479,017
Int. Cl.² C08G 6/00
U.S. Cl. 260—23 H 11 Claims

1. A polymer subject to degradation on exposure to ultraviolet radiation stabilized against degradation on exposure to ultraviolet radiation by an effective amount of a nickel amine, nickel aquo, or nickel bis- complex of 2,2′-thiobis(p-alkylphenol) wherein each alkyl group has up to 18 carbon atoms and further stabilized against thermal degradation of said complex on exposure to heat by an effective amount of a hydroxyalkylamide of the formula



wherein R_1 is alkyl or aryl; R_2 is hydroxyalkyl of 2 to 4 carbon atoms; and R_3 is hydrogen or hydroxyalkyl of 2 to 4 carbon atoms.

3,932,325
PROCESS FOR PREPARING 6-CHLORO-2-CHLOROMETHYL-4-PHENYLQUINAZOLINE-3-OXIDE AND INTERMEDIATES THEREFOR

Susumu Nakanishi, Niantic, and Wayne E. Barth, East Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,103
Int. Cl.² C07D 239/76
U.S. Cl. 260—251 Q 1 Claim

1. A process for preparing 6-chloro-2-chloromethyl-4-phenylquinazoline-3-oxide which comprises the steps of

a. adding chloroacetyl chloride to a solution under nitrogen atmosphere of 2-amino-5-chlorobenzophenone in methylene chloride, chloroform, benzene or ethyl acetate and 3 N NaOH solution and stirring at 5°–25°C for about 1–4 hours;

b. separating and contacting the resulting 2-chloroacetamido-5-chlorobenzophenone of step (a) in methylene chloride, chloroform or benzene solvent solution with thionyl chloride, phosgene or phosphorus pentachloride in pyridine under nitrogen atmosphere and heating under reflux; and

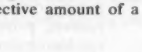
c. contacting the resulting crude methylene chloride, chloroform or benzene solvent solution of 2-(1′-chloroimino-2′-chloromethyl)-5-chlorobenzophenone of step (b) with hydroxylamine hydrochloride and pyridine, stirring at 25°–80°C, pouring reaction mixture into ice-water solution of sodium carbonate, drying the resulting separated methylene chloride, chloroform or benzene layer, concentrating and replacing the methylene chloride, chloroform or benzene with hexane, and collecting formed crystalline 6-chloro-2-chloromethyl-4-phenylquinazoline-3-oxide.

3,932,326
SOFT THERMOPLASTIC SEGMENTED COPOLYESTERS AS PRESSURE SENSITIVE ADHESIVES

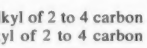
George Lok Kwong Hoh, and Joseph Edward Reardon, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. Nos. 333,519, Feb. 20, 1973, abandoned, and Ser. No. 406,650, Oct. 9, 1973, abandoned. This application Feb. 6, 1974, Ser. No. 439,848
Int. Cl.² C08G 63/12; C08L 91/06, 93/04, 95/00
U.S. Cl. 260—26 11 Claims

1. A soft thermoplastic segmented copolyester elastomer consisting essentially of a multiplicity of recurring short chain ester units and long chain ester units joined through ester linkages, said short chain ester units amounting to 15 to less than 30 percent by weight of said copolyester and being of the formula



and said long chain ester units amounting to more than 70 to 85 percent by weight of said copolyester and being of the formula



wherein R is the divalent aromatic radical remaining after removal of the carboxyl groups from aromatic dicarboxylic acid having a molecular weight of less than 350, said aromatic dicarboxylic acid being 55 to 95 percent by weight terephthalic acid, D is the divalent radical remaining after removal of the hydroxyl groups from butanediol, and G is the divalent radical remaining after removal of the terminal hydroxyl groups from polytetramethylene ether glycol having an average molecular weight of 1,500 to 3,500, said copolyester having a melt index of less than 30 and a melting point of 90° to 130°C.

3,932,327
ADHESIVE COMPOSITIONS

Floyd E. Naylor, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 5, 1973, Ser. No. 329,558
Int. Cl.² C08K 5/01; C08L 93/04
U.S. Cl. 260—27 BB 8 Claims

1. An adhesive composition comprising:

a. A block copolymer selected from the group consisting of a linear block copolymer represented by the general formula:

A–B–A

and a radial block copolymer represented by the general formula:

$Z(-BA)_m$

wherein A is a terminal block segment consisting essentially of polymer formed from monovinyl-substituted aromatic hydrocarbon units which comprise 20 to 40 weight percent of said block copolymer, B is a block segment consisting essentially of polymer formed from conjugated diene hydrocarbon units which comprise 60 to 80 weight percent of said block copolymer, Z is derived from a polyfunctional compound having at least three reactive sites, and m is an integer having a value of not less than 3;

b. a block copolymer selected from the group consisting of a linear block copolymer represented by the general formula:

B–A–B

and a radial block copolymer represented by the general formula:

$Z(-AB)_n$

wherein B is a terminal block segment consisting essentially of polymer formed from conjugated diene hydrocarbon units which comprise 30 to 90 weight percent of said block copolymer, A is a block segment consisting essentially of polymer formed from monovinyl-substituted aromatic hydrocarbon units which comprise 10 to 70 weight percent of said block copolymer, Z is derived from a polyfunctional compound having at least three reactive sites, and n is an integer having a value of not less than 3;

c. a resinous tackifier; and,

d. an organic solvent which is inert toward each of said (a), (b) and (c); wherein the weight ratio of said first block copolymer (a) to said second block copolymer (b) is in the approximate range of 20:1 to 1.5:1 and wherein the weight ratio of the combination of said (a) and (b) to said tackifier (c) is in the approximate range of 0.05:1 to 20:1.

3,932,328

HOT MELT ADHESIVE COMPOSITION AND TAPE

Ralf Korpman, Somerville, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 195,015, Nov. 2, 1971, abandoned. This application Oct. 17, 1973, Ser. No. 407,331

Int. Cl.[2] C08K 5/01; C08L 53/02, 93/04; C09J 7/04

U.S. Cl. 260—27 BB 5 Claims

1. A substantially oil-free hot melt pressure-sensitive adhesive composition comprising an elastomeric component which comprises a major amount by weight of said component of an A-B-A block copolymer wherein B is an elastomeric polymer block derived from isoprene and A is a thermoplastic polymer block derived from styrene, said A blocks constituting about 8–35 percent by weight of the block copolymer; and about 125–300 parts per one hundred parts by weight of the elastomeric component of a tackifying component consisting essentially of a blend of normally solid and liquid tackifier resins, the proportion of solid resin to liquid resin in the blend being between about 4 to 1 and 1 to 3, said solid resins being normally friable at about 25° C. and said liquid resins being in a liquid state at about 25° C., and said solid resins consisting essentially of polymerized structures derived from aliphatic dienes and mono-olefins of 5 or 6 carbon atoms, at least 40 percent by weight of said structures being derived from piperylene or from piperylene and isoprene.

3,932,329

ADHESIVE COMPOSITION

Pallavoor R. Lakshmanan, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 1, 1974, Ser. No. 493,773

Int. Cl.[2] C08L 93/04

U.S. Cl. 260—27 R 7 Claims

1. An adhesive composition consisting essentially of a styrene-isoprene block copolymer, a zinc salt of rosin and a microcrystalline wax wherein the components are present in the following ranges:

Component	Weight Per Cent
Styrene-Isoprene Block Copolymer	20–35
Zinc Salt of Rosin	20–50
Microcrystalline Wax	60–15.

3,932,330

ADHESIVE COMPOSITION

Pallavoor R. Lakshmanan, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 1, 1974, Ser. No. 493,774

Int. Cl.[2] C08L 91/00, 93/00; C09J 3/12, 3/14

U.S. Cl. 260—27 BB 6 Claims

1. An adhesive composition consisting essentially of a styrene-isoprene block copolymer, an isoprene-piperylene copolymer, a zinc salt of rosin having a zinc content of between about four and about nine percent and a melting point of between about 80° to about 190° C. and a microcrystalline wax, wherein the weight ratio of the zinc salt of rosin to the isoprene-piperylene copolymer is in the range of about 0.55:1 to about 50:1, wherein the components are present in the following ranges:

Component	Weight Per Cent
Styrene-Isoprene Mixture of Isoprene-Piperylene Copolymer and Zinc Salt of Microcrystalline Wax	Rosin 70–10,

wherein the styrene-isoprene block copolymer has the following general configuration:

$$A-B-A,$$

wherein A is a styrene polymer block having an average molecular weight of about 2,000 to about 100,000 and B is an isoprene polymer block having an average molecular weight of about 25,000 to about 1,000,000, wherein the total of the terminal blocks A amount to about eight to about 50 weight percent of the block copolymer, with the difference in glass transition temperature between an end block A and a center block B being greater than about 100° C.

3,932,331

METHOD FOR RAPID HARDENING OF ASPHALT EMULSIONS

Tadashi Doi, Osaka; Isao Sekido, Wakayama, and Ryoichi Tamaki, Arita, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1974, Ser. No. 521,522

Claims priority, application Japan, Nov. 9, 1973, 48-126030

Int. Cl.[2] C08L 91/00

U.S. Cl. 260—28 7 Claims

1. A method for rapidly hardening an aqueous, oil-in-water type, cationic or anionic, road-surfacing asphalt emulsion containing from about 55 to 65 weight percent asphalt or mixture of asphalt and synthetic rubber, emulsifier and the balance is water, which comprises incorporating into said emulsion from 1 to 35 percent by weight, based on the weight of said emulsion, an isocyanate-terminated, water-soluble, urethane prepolymer obtained by reacting an organic diisocyanate with polyalkylene glycol having the formula

$$(HO\text{-}(CH_2CH_2O)_p\text{-}(CH_2\text{—}\underset{\displaystyle CH_2}{\underset{|}{CHO}})_r\text{-}(CH_2CH_2O)_q\text{-}H$$

wherein $p+r \geq q$, $q \geq 0$, $p \geq 1$, $r \geq 1$, and $20 < p+q+r < 100$, at a ratio of 1.1 to 2.0 equivalents of the NCO groups of said organic diisocyanate, per one equivalent of the OH groups of said polyalkylene glycol.

3,932,332

COPOLYMERS OF ALPHA-METHYLSTYRENE AND STYRENE AND USES THEREOF

Paul S. Douglas, Jefferson Township, Fayette County; Anargiros Pete Patellis, Rostraver Township, Westmoreland County, and Walter A. Vredenburgh, Pleasant Hills, all of Pa., assignors to Hercules Incorporated, Wilmington, Del.

Filed Feb. 16, 1973, Ser. No. 333,215

Int. Cl.[2] C08F 212/08

U.S. Cl. 260—28.5 A 3 Claims

1. A hot melt composition comprising (i) a wax selected from the group consisting of paraffin wax and microcrystalline wax, (ii) ethylene vinyl acetate, and (iii) a copolymer of alpha-methylstyrene and styrene which copolymer has a softening point (ring and ball) up to about 100°C.

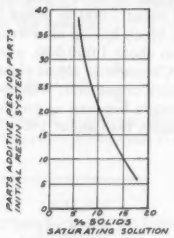
3,932,333
EMULSIFIED PHENOLIC RESIN SYSTEM CONTAINING AN ANTI-MIGRATORY ADDITIVE

Woodrow Hayes Ingram, II, Hampden, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 142,905, May 13, 1971, Pat. No. 3,719,616, which is a continuation-in-part of Ser. No. 8,679, Feb. 4, 1970, abandoned. This application Jan. 15, 1973, Ser. No. 323,680

Int. Cl.² C08L *61/06*

U.S. Cl. 260—29.3 **6 Claims**



1. A composition of matter comprising in combination:

A. a stable emulsified phenol-formaldehyde resole resin having a water dilutability of from 15 percent to 2000 percent based on the resin solids, a formaldehyde to phenol combined mole ratio of from about 0.85 to 3.0 and a viscosity in methanol solution at 60 weight percent solids of not greater than about 10,000 centipoises and in the form of spherules dispersed in aqueous medium of which at least about 80 weight percent of the spherules have a maximum dimension from about 0.01 to 0.8 microns and containing:

1. a quantity of solids ranging from about 5 to 45 parts by weight;
2. a quantity of organic liquid ranging from about 0 to 20 parts by weight, and
3. a quantity of water ranging from 35 to 95 parts by weight; and

B. a water soluble polyelectrolyte selected from the group consisting of:

1. polyacrylic acid and copolymers of acrylic acid and vinyl acetate containing up to 50 mole percent of vinyl acetate and the ammonium and alkali metal salts thereof,
2. polymethacrylic acid and copolymers of methacrylic acid and vinyl acetate containing up to 50 mole percent of vinyl acetate and the ammonium and alkali metal salts thereof,
3. copolymers of maleic anhydride and a comonomer selected from the group consisting of ethylene, propylene, butylene, styrene, chlorostyrene, vinyl toluene, vinyl formate, vinyl acetate, vinyl propionate, and vinyl benzoate and the ammonium and alkali metal salts thereof,
4. copolymers of a monoalkyl maleate wherein the alkyl group is methyl, ethyl, propyl, or butyl and a comonomer selected from the group consisting of ethylene, propylene, butylene, styrene, chlorostyrene, vinyltoluene, vinyl formate, vinyl acetate, vinyl propionate, and vinyl benzoate and the ammonium and alkali metal salts thereof, and
5. copolymers of acrylic acid and 2-ethylhexyl acrylate containing 93.5 to 98.5 mole percent of acrylic and 6.5 –1.5 mole percent of 2-ethylhexyl acrylate;

wherein the amount of water soluble polyelectrolyte is in the range from 0.04 to 20 percent by weight based on the total solids weight of phenol-formaldehyde resin.

3,932,334
CALCIA CATALYZED RESINS

Hendrik H. J. Deuzeman; Norman Lumley, and Ruben A. Santos, all of P.O. Box 3005, Sarnia, Ontario, Canada

Continuation-in-part of Ser. No. 400,145, Sept. 24, 1973, abandoned, Continuation-in-part of Ser. No. 226,265, Feb. 14, 1972, abandoned, Continuation-in-part of Ser. No. 44,616, June 8, 1970, abandoned, Continuation-in-part of Ser. No. 226,234, Feb. 14, 1972, abandoned. This application Mar. 21, 1974, Ser. No. 453,646

Int. Cl. C08g *51/24*

U.S. Cl. 260—29.3 **22 Claims**

1. A method for making an infinitely dilutable low phenol aqueous solution of thermosettable phenol formaldehyde resin, by selectively catalyzing and controlling the methylolation of phenol with formaldehyde to increase resinification, minimize the content of monomethylol phenols and higher phenyls and maximize the content of o-p-dimethylol phenols, thus producing a resin solution component for binder formulations having low air and wash water-polluting characteristics when applied to a substrate, comprising the steps of:

a. mixing U.S.P. phenol, in the absence of other monomers, with aqueous formaldehyde, in an amount of 3.5 to 4.5 of moles of formaldehyde per mol of phenol, and correspondingly up to about 10 moles of water per mol of the reactants, at a temperature not exceeding about 85°F, and,

b. introducing calcium oxide or calcium hydroxide catalyst, with cooling in an amount of 4.9 to 7 percent as calcium (Ca) based upon the weight of phenol, (0.11 mol to 0.16 mol calcium (Ca) per mol of phenol),

c. controlling the exothermic rise in the temperature of the reactants without heat input so as to increase to not more than about 125°F during at least the first hour of reaction,

d. continuing the methylolation reaction without heat input at a suitable temperature up to 155°F, and

e. terminating said reaction by cooling when the condensation reaction product is substantially phenol-free, is still water soluble, and contains between 3 to 16% unreacted formaldehyde.

3,932,335
ADHESIVE COMPOSITION OF VINYL ESTER POLYMER, POLYVINYL ALCOHOL, GLYOXAL, AND A WATER MISCIBLE ALCOHOL

Bert Sorelle Gorton, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed June 29, 1970, Ser. No. 50,896

Int. Cl.² C08L *31/04*

U.S. Cl. 260—29.6 WA **8 Claims**

1. An aqueous dispersion of a water-resistant adhesive composition consisting essentially of a homo- or copolymer of a vinyl ester of aliphatic monocarboxylic acid, polyvinyl alcohol in an amount from about 2 to 10 percent by weight of the polymer, glyoxal in an amount from about 2 to 15 percent by weight of the polymer and a water-miscible alcohol having 1-3 carbon atoms in an amount from about 3.5 to 17.0 percent by weight of the polymer.

3,932,336
EMULSION POLYMERIZATION OF VINYL BROMIDE WITH VINYL COMONOMER

Edwin D. Hornbaker, and Bryan Sparks, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 299,250, Oct. 20, 1972, Pat. No. 3,864,297, which is a continuation-in-part of Ser. No. 147,620, May 27, 1971, abandoned. This application Nov. 21, 1973, Ser. No. 417,887

Int. Cl.² C08L *27/10*

U.S. Cl. 260—29.6 R **28 Claims**

1. A process for the production of poly(vinyl bromide) copolymer latexes from vinyl bromide monomer and a monomer copolymerizable therewith, said monomer copolymeriz-

able therewith being selected from the group consisting of vinyl acetate, methyl acrylate, ethyl acrylate, propyl acrylate, acrylamide, acrylic acid, methacrylic acid, vinyl chloride and vinylidene chloride, wherein up to about 75 percent by weight of said vinyl bromide monomer is replaced with said monomer copolymerizable therewith, comprising adding an aqueous solution of a reducing agent to an emulsion of vinyl bromide monomer containing a water-soluble peroxide compound, wherein said emulsion is at a temperature of from about 0°C to about 75°C, and said aqueous solution of said reducing agent is added to said emulsion at a rate of:

a. at least about 2.8×10^{-4} equivalent of said reducing agent per hour per hundred parts by weight of said monomer, said emulsion containing about 1.5×10^{-3} equivalent of a peroxidic compound per hundred parts by weight of said monomer, but

b. not more than about 8.7×10^{-4} equivalent of said reducing agent per hour per hundred parts by weight of said monomer, said emulsion containing about 4.6×10^{-3} equivalent of a peroxidic compound per hundred parts by weight of said monomer.

3,932,337
THERMOPLASTIC URETHANE COMPOUND HAVING LOW COMPRESSION SET AND HIGH MODULUS

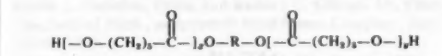
Kanu G. Shah, Arlington Heights, Ill., assignor to The Richardson Company, Des Plaines, Ill.

Filed Apr. 25, 1974, Ser. No. 464,050
Int. Cl.² C08G 18/61; C08K 3/34
U.S. Cl. 260—29.1 SB **4 Claims**

1. A plastic molding composition exhibiting thermoplastic properties at molding temperatures and thermoset properties at room temperature which comprises

A. The reaction product of:

1. from about 7.5 to about 13 mol percent of a poly(epsilon-caprolactone) polymer having the general formula:



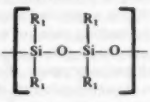
wherein R is alkyl, alkenyl aryl having from one to 10 OH, carbon atoms, where x and y can vary depending on the ratio of the reactants,

2. from about 33 to about 41 mol percent of a lower alkyl glycol, and

3. from about 48 to about 57 mol percent of an organic diisocyanate;

and having a molar ratio of isocyanate groups to isocyanate reactable hydroxy groups of from about 1.05 to 1.15; and

B. from about 0.3 to about 1.0 parts per 100 parts by weight of said reaction product of a siloxane polymer having the following general formula:



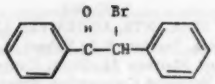
wherein R_1 is alkyl, alkenyl or aromatic.

3,932,338
PHOTODEGRADABLE PLASTICS CONTAINING β-HALOPHENYL KETONES

Bernard Freedman, Berkeley, and Martin J. Diamond, Oakland, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 22, 1974, Ser. No. 499,805
Int. Cl.² C08K 5/07
U.S. Cl. 260—32.8 A **1 Claim**

1. A photodegradable composition consisting of a polyolefin and about from 0.1 to 10% of an additive of the structure



3,932,339
PRODUCT AND PROCESS

Gordon D. McLeod, Adrian, Mich., assignor to G. D. McLeod & Sons, Incorporated, Adrian, Mich.

Continuation-in-part of Ser. No. 283,964, Aug. 28, 1972, which is a continuation-in-part of Ser. No. 107,578, Jan. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 75,306, Sept. 24, 1970, abandoned. This application Oct. 24, 1973, Ser. No. 409,067
Int. Cl.² C08K 5/07
U.S. Cl. 260—32.8 SB **55 Claims**

1. An essentially anhydrous polyol silicate composition consisting essentially of solvent-soluble, polyol silicate ester-exchange reaction product of (1) silicate consisting essentially of a member selected from the group consisting of (a) ortho silicates having ester-exchangeable groups of 1 to 6 carbon atoms selected from the group consisting of alkyl, hydroxyalkyl, alkoxyalkyl and hydroxyalkoxyalkyl; (b) siloxanes of (a); and (c) mixtures of (a) and (b); with the proviso that when (1) is (a), (1) has one or more groups selected from the group consisting of hydroxyalkyl, alkoxyalkyl or hydroxyalkoxyalkyl; and (2) aliphatic polyol which is esterexchangeable with (1) said reaction product being made by reacting (1) and (2) in amounts providing a ratio of hydroxyl groups of (2) of about 0.15 to 1.8 moles per mole of ester-exchangeable group of (1); and said reaction product being in a liquid organic solvent.

3,932,340
NYLON COATING COMPOSITION

Minoru Kamosaki, and Sigei Asai, both of Saitama, Japan, assignors to Daicel Ltd., Osaka, Japan

Filed Aug. 19, 1974, Ser. No. 498,396
Claims priority, application Japan, Aug. 21, 1973, 48-93569
Int. Cl.² C08K 5/01, 5/02, 5/05; C08L 77/02
U.S. Cl. 260—33.4 R **5 Claims**

1. A coating composition comprising a solution of (1) an alcohol-soluble nylon polymer selected from the group consisting of ε-caprolactam/hexamethylenediamine adipate copolymer, ε-caprolactam/laurolactam copolymer, ε-caprolactam/hexamethylenediamine adipate/laurolactam terpolymer and ε-caprolactam/hexamethylenediamine adipate/hexamethylenedodecanedioamide terpolymer, (2) from 5 to 90 weight percent of the total of (1) and (2), calculated as an N-alkoxymethylated nylon of a degree of alkoxymethylation of 30 molar percent, of an N-alkoxymethylated nylon selected from the group consisting of methoxymethylated ε-caprolactam polymer, methoxymethylated hexamethylenediamine adipate polymer, methoxymethylated ε-caprolactam/laurolactam copolymer and propoxymethylated ε-caprolactam polymer, and (3) from 0.5 to 8 weight percent, based on the weight of the N-alkoxymethylated nylon (2), of an acid catalyst selected from the group consisting of tartaric acid, maleic acid, crotonic acid, malonic acid, succinic acid, oxalic acid, adipic acid, citric acid, o-, m- and p- hydroxybenzoic acids, 2,4-dihydroxybenzoic acid, 2-hydroxy-4-methoxybenzoic acid, hypophosphorous acid, chromic acid anhydride and p-toluenesulfonic acid, dissolved in (4) a solvent selected from the group consisting of alkanols of 1 to 6 carbon atoms, chlorinated aliphatic hydrocarbons of 1 to 6 carbon atoms, aromatic hydrocarbons and mixtures thereof.

3,932,341

HOT MELT SEALANTS, ADHESIVES AND THE LIKE

Edward F. Kutch, Trenton, N.J.; Robert M. Meyers, Fairless Hills, Pa., and Matthew M. Sitter, Convent Station, N.J., assignors to Novagard Corporation, Trenton, N.J.

Continuation of Ser. No. 256,928, May 25, 1972, abandoned. This application Apr. 12, 1974, Ser. No. 460,332
Int. Cl.[2] C08K 5/01, 5/12, 5/52; C08L 95/00
U.S. Cl. 260—33.6 5 Claims

1. Solvent free hot-melt compositions adapted to be extruded as sealants, adhesives, caulking compounds, expansion joints and the like consisting essentially of an unreacted mechanical mixture of 100 parts by weight of polymerized elastomeric butyl rubber composed essentially of a copolymer of isobutylene and isoprene having a molecular weight above about 15,000; with from 1 to 400 parts by weight of tackifying resin selected from the group consisting of terpene resins, polyterpene resins, phenolic resins, hydrogenated rosin, hydrocarbon resins and mixtures thereof; from 15 to 600 parts by weight of plasticizer selected from the group consisting of polybutenes, low molecular weight polyisobutylenes, phosphate esters, dibutyl phthalate, straight chain aliphatic acid esters, parafine oils, coal tars, asphalts, chlorinated polyphenyl, chlorinated biphenyl and mixtures thereof; from about 0.5 to 60 parts by weight of adhesion promoter comprising an epoxy resin having an epoxide equivalent of from about 150 to 300; and from about 5 to 1,000 parts by weight of inert filler material, said composition being readily extrudable at temperatures above about 150°F. while hardening upon cooling without undergoing chemical change, and having a hardness of about 5 to 95 on a Shore A Durometer at room temperature.

3,932,342

METHYL METHACRYLATE LACQUERS CONTAINING POLYISOCYANATES

Nobuyoshi Nagata, Nara, and Ryuzo Mizuguchi, Osaka, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation of Ser. No. 199,020, Nov. 15, 1971, abandoned, which is a continuation of Ser. No. 689,764, Dec. 2, 1967, abandoned. This application Sept. 18, 1973, Ser. No. 398,370
Claims priority, application Japan, Dec. 14, 1966, 41-81548
Int. Cl.[2] C08G 18/06
U.S. Cl. 260—37 N 20 Claims

1. A coating composition comprising a solvent incapable of reacting with an isocyanate group and film-forming ingredients consisting of (A) a copolymer obtained by copolymerizing 85 to 90 parts by weight of methyl methacrylate with 10 to 15 parts by weight of a polymerizable monomer having at least one hydroxyl group in the molecule selected from the group consisting of 2-hydroxalkyl acrylates, 2-hydroxyalkyl methacrylates, N-methylol acrylamide, N-methylol methacrylamide, allyl alcohol, methallyl alcohol and crotyl alcohol, the total amount of the two being 100 parts by weight and (B) at least one polyisocyanate compound having at least two isocyanate groups in the molecule added to said copolymer in an amount of 0.2 to 5.0 equivalents to the hydroxyl groups of said copolymer.

3,932,343

MIXED EPOXY RESIN-MIXED ANHYDRIDE ADHESIVE COMPOSITIONS

Walter P. Barie, Jr., Shaler Township, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 9, 1974, Ser. No. 468,553
Int. Cl.[2] C08G 51/04, 45/04
U.S. Cl. 260—37 EP 9 Claims

6. A new cured adhesive composition comprising

3,4,3′,4′-benzophenone tetracarboxylic dianhydride and maleic anhydride in a weight ratio of from about 4:1 to about 1:3; and

a polyglycidyl ether of a phenol-formaldehyde novolac resin having an average of two to about four epoxy groups per molecule and a diglycidyl ether of a dihydric phenol having a molecular weight between about 350 and 600 in an amount to provide an A/E ratio of between about 0.4 and about 1.5 at a weight ratio of the polyglycidyl ether of the novolac resin to the diglycidyl ether of a dihydric phenol of between about 4:1 to about 1:3;

said composition prepared at a temperature between about 100° C. and about 250° C. in the presence of about 0.1 part to about 5 parts of a metal complex of acetylacetone selected from the group consisting of zinc acetylacetonate, iron acetylacetonate, aluminum acetylacetonate, magnesium acetylacetonate, nickel acetylacetonate and zirconium acetylacetonate per 100 parts of epoxy resin.

3,932,344

COMPOSITE WIRE CONTAINING A MIXTURE OF PHENOLIC AND THERMOPLASTIC RESINS AS A BINDER

William R. O'Day, Jr., Concord; Norman D. Bensky, Lexington, and James D. Le Blanc, Winthrop, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Feb. 22, 1974, Ser. No. 444,702
Int. Cl.[2] C08L 61/10
U.S. Cl. 260—38 9 Claims

1. As an article of manufacture, a composite wire adapted for flame spraying consisting essentially of a particulate material selected from the group consisting of molybdenum, boron, tantalum, tungsten, tungsten carbide, silicon carbide, alumina, zirconia, oxides of chrome, titania, alloys of nickel and chromium with iron, and mixtures of these, said material having a particle size smaller than 80-mesh in an admixture with a mixture of a thermoplastic resin and a phenolic resin in a cured state wherein said material comprises from about 75 percent to about 97½ percent by weight of total composite with the balance being said phenolic resin and thermoplastic resin in a ratio to each other of 4:1 to 1:9.

3,932,345

METHOD FOR PREPARING PIGMENTED POLYESTERS WHEREIN THE PIGMENT GLYCOL SLURRY IS PREHEATED

Roger A. Champlin, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 6, 1975, Ser. No. 547,686
Int. Cl.[2] C08L 67/02
U.S. Cl. 260—40 P 4 Claims

1. In a process for preparing uniformly pigmented polyesters formed by reacting a mixture of at least one dicarboxylic acid and at least one glycol in a solvent consisting of preformed polyester having a molecular weight ranging from about 200 to about 3000 in a reaction vessel at a temperature ranging from above the melting point of said solvent to about 300° C. and at a pressure ranging from about 20 to about 1000 pounds per square inch gauge pressure, distilling out the water formed in the reaction at such a rate that the pressure remains constant within said range, adding a condensation polymerization catalyst and then heating and reacting the mixture at a temperature ranging from about 265° to 285° C. at a pressure of about one millimeter of mercury pressure or less until high molecular weight polyester having an intrinsic viscosity of at least 0.4 is formed and wherein during the course of said process a slurry consisting o. a pigmenting agent and a glycol is added to the mixture, the improvement which comprises heating the slurry to a temperature from about 90° C. to about 1° to 2° C. below the boiling point of said slurry and adding said heated slurry to the reaction mixture of dicarboxylic acid and glycol in the preformed polyester solvent when the temperature of said reacting mixture ranges from about 210° C. to about 240° C. and the pressure in the reaction vessel ranges from about 20 to about 70 pounds per square inch gauge pressure.

3,932,346

PIGMENTED PHOTOPOLYMERIZABLE COMPOUNDS STABILIZED AGAINST PREMATURE GELATION WITH THIOCARBAMATES

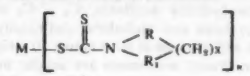
George Pasternack, Chicago, and Thor Jondahl, Oak Park, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 452,227, March 18, 1974, abandoned. This application May 29, 1975, Ser. No. 582,000

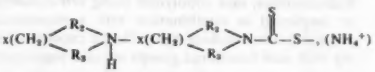
Int. Cl.[2] C08K *5/00*

U.S. Cl. 260—42.21 17 Claims

1. A photopolymerizable composition stabilized to gel formation comprised of a metal phthalocyanine pigmented ethylenically unsaturated ester and a stabilizing amount of a thiocarbamate compound having the formula



wherein M is selected from the group consisting of



and a metal cation having a valence of 1 to 3 and each of R, R_1, R_2 and R_3 are selected from the group consisting of hydrogen, aryl, alkyl groups having 1 to 20 carbon atoms, aralkyl and alkaryl groups having 7 to 15 carbon atoms and amino-, sulfo-and oxy-substituted alkyl and aryl groups, *n* is an integer of 1 to 3 and *x* is an integer of 0 to 1.

3,932,347

POWDER PAINTS CONTAINING PARTICULATE METAL I

Melville J. Camelon, Utica, and Rodney C. Gibeau, Mt. Clemens, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 422,472, Dec. 6, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,486

Int. Cl.[2] C08K *3/08, 9/04, 9/10*

U.S. Cl. 260—42.14 14 Claims

1. In a powder paint which exclusive of catalysts, antistatic agents, plasticizers, and flow control agents, the same being known and optional additive to powder paints, consists essentially of aluminum flakes, non-metal pigment, and a particulate, organic, film-former, the improvement wherein

A. non-metal pigment comprises 0 to about 22 weight percent of said powder paint,

B. said aluminum flakes comprise about 0.005 to about 24 weight percent of said powder paint and are encapsulated prior to admixture with said particulate, organic, film-former with about 2 to about 200 parts by weight of a continuous coating of a thermosettable, organic, film-former per 100 parts by weight of aluminum flakes, said thermosettable, organic, film-former consisting essentially of a copolymer having average molecular weight (M_n) in the range of about 1500 to about 15,000 and glass transition temperature in the range of about 40°C. to about 90°C., bearing functional groups provided by constituent monomers selected from the group consisting of glycidyl esters of a monoethylenically unsaturated carboxylic acid, $C_5 - C_7$ monohydroxy acrylates, $C_5 - C_7$ monohydroxy methacrylates, and alpha-beta olefinically unsaturated amides and wherein at least above 50 weight percent of the constituent monomers are acrylic monomers and the remainder weight percent, if any, consists essentially of C_8–C_{12} monovinyl hydrocarbons, said copolymer being self-crosslinkable or employed in combination with a monomeric or polymeric crosslinking agent that is capable of reacting with functional groups on said copolymer, and

C. said particulate, organic, film-former is selected from the group consisting of

1. a thermoplastic, particulate, film-former having average molecular weight (M_n) in the range of about 30,000 to about 80,000 and a glass transition temperature in the range of about 60°C. to about 110°C., said thermoplastic, particulate, film-former being a polymer of alpha-beta olefinically unsaturated monomers of which about 51 to about 100 weight percent are acrylic monomers and 0 to about 49 weight percent are C_8–C_{12} monovinyl hydrocarbons, and

2. thermosettable, particulate, film-formers consisting essentially of a copolymer having average molecular weight (M_n) in the range of about 1500 to about 15,000 and glass transition temperature in the range of about 40°C. to about 90°C., bearing functional groups provided by constituent monomers selected from the group consisting of glycidyl esters of a monoethylenically unsaturated carboxylic acid, $C_5 - C_7$ monohydroxy acrylates, $C_5 - C_7$ monohydroxy methacrylates, and alpha-beta olefinically unsaturated amides and wherein at least above 50 weight percent of the constituent monomers are acrylic monomers and the remainder weight percent, if any, consists essentially of C_8–C_{12} monovinyl hydrocarbons said copolymer being self-crosslinkable or employed with a monomeric or polymeric crosslinking agent that is capable of reacting with functional groups on said copolymer.

3,932,348

POWDER PAINTS HAVING ALUMINUM FLAKES ENCAPSULATED IN THERMOSETTABLE MATERIAL CONTAINING TETRAALKYLAMMONIUM HALIDES

Melville J. Camelon, Utica, and Rodney C. Gibeau, Mount Clemens, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 422,474, Dec. 6, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,488

Int. Cl.[2] C08K *3/08, 9/04, 9/10*

U.S. Cl. 260—42.14 22 Claims

1. In a powder paint which exclusive of catalysts, antistatic agents, plasticizers and flow control agents, the same being known and optional additives to powder paints, consists essentially of aluminum flakes, non-metal pigment and a particulate, organic, film-former, the improvement wherein

A. said non-metal pigment comprises 0 to about 22 weight percent of said powder paint,

B. said aluminum flakes comprise about 0.005 to about 25 weight percent of said powder paint and are encapsulated prior to admixture with said particulate, organic, film-former with about 2 to about 200 parts by weight of a continuous coating of a thermosettable, organic, film-former per 100 parts by weight aluminum flakes, said thermosettable, organic, film-former consisting essentially of a copolymer having average molecular weight (M_n) in the range of about 1500 to about 15,000 and glass transition temperature in the range of about 40°C. to about 90°C., bearing functional groups provided by constituent monomers selected from the group consisting of glycidyl esters of a monoethylenically unsaturated carboxylic acid, $C_5 - C_7$ monohydroxy acrylates, $C_5 - C_7$ monohydroxy methacrylates and alpha-beta olefinically unsaturated amides and wherein at least above 50 weight percent of the constituent monomers are selected from acrylic monomers and the remainder weight percent, if any, of the constituent monomers consists essentially of $C_8 - C_{12}$ monovinyl hydrocarbons said copolymer being self-crosslinkable or employed in combination with a monomeric or polymeric crosslinking agent that is capable of reacting with said functional groups on said copolymer and containing about 0.05 to about 20 parts by weight of an ammonium salt selected from the group consisting of tetraalkylammonium halides and substituted

tetraalkylammonium halides wherein at least one alkyl radical is replaced with an aryl, phenoxy or alkoxy radical per 100 parts by weight of said thermosettable, organic, film-former, and

C. said particulate, organic, film-former is selected from the group consisting of

1. a thermoplastic, particulate film-former that is a polymer of alpha-beta olefinically, unsaturated monomers of which about 51 to about 100 weight percent are acrylic monomers and 0 to about 49 weight percent are monovinyl hydrocarbons, and

2. thermosettable, particulate, film-formers consisting essentially of a copolymer having average molecular weight (M_n) in the range of about 1500 to about 15,000 and glass transition temperature in the range of about 40°C. to about 90°C., bearing functional groups provided by constituent monomers selected from the group consisting of glycidyl esters of a monoethylenically unsaturated carboxylic acid, $C_5 - C_7$ monohydroxy acrylates, $C_5 - C_7$ monohydroxy methacrylates and alpha-beta olefinically unsaturated amides and wherein at least about 50 weight percent of the constituent monomers are selected from acrylic monomers and the remainder weight percent, if any, of the constituent monomers consists essentially of $C_8 - C_{12}$ monovinyl hydrocarbons, said copolymer being self-crosslinkable or employed in combination with a monomeric or polymeric crosslinking agent that is capable of reacting with said functional groups on said copolymer.

3,932,349

THERMOSETTABLE POWDER PAINTS CONTAINING ENCAPSULATED ALUMINUM FLAKES II

Melville J. Camelon, Utica, and Rodney C. Gibeau, Mount Clemens, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 422,475, Dec. 6, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,489

Int. Cl.² C08K *3/08, 9/04, 9/10*

U.S. Cl. 260—42.14 **17 Claims**

1. In a powder paint which exclusive of catalysts, antistatic agents, plasticizers, and flow control agents, the same being known and optional additives to powder paints, consists essentially of aluminum flakes, non-metal pigment, and a particulate, organic, film-former, the improvement wherein

A. said non-metal pigment comprises 0 to about 22 weight percent of said powder point,

B. said aluminum flakes comprise about 0.005 to about 25 weight percent of said powder paint and are encapsulated prior to admixture with said particulate, organic, film-former with about 2 to about 200 parts by weight of a continuous coating of a thermoplastic, organic, film-former per 100 parts by weight aluminum flakes, said thermoplastic, organic, film-former consisting essentially of a thermoplastic, organic, film-former selected from the group consisting of

1. polymers of alpha-beta olefinically unsaturated monomers of which about 51 to 100 weight percent are acrylic monomers and 0 to about 49 weight percent are monovinyl hydrocarbons,

2. polyamides,

3. polyesters,

4. homopolymers of monovinyl hydrocarbons,

5. cellulose acetate, and

6. cellulose butyrate, and containing about 0.05 to about 20 parts by weight of an ammonium salt selected from the group consisting of tetraalkylammonium halides and substituted tetraalkylammonium halides wherein at least one alkyl radical is replaced with an aryl, phenoxy or alkoxy radical per 100 parts by weight of said thermoplastic, organic, film-former, and

C. said particulate, organic, film-former is selected from the group consisting of

1. a thermoplastic, particulate, film-former that is a copolymer of alpha-beta olefinically unsaturated monomers of which about 51 to about 100 weight percent are acrylic monomers and 0 to about 49 weight percent are monovinyl hydrocarbons, and

2. thermosettable, particulate, film-formers consisting essentially of an epoxy- functional copolymer having average molecular weight (M_n) in the range of about 1500 to about 15,000 and glass transition temperature in the range of about 40°C. to about 90°C. bearing functional groups provided by constituent monomers selected from the group consisting of glycidyl esters of a monoethylenically unsaturated carboxylic acid, $C_5 - C_7$ monohydroxy acrylates, $C_5 - C_7$ monohydroxy methacrylates and alphabeta olefinically unsaturated amides and wherein at least above 50 weight percent of the constituent monomers are acrylic monomers and the remainder weight percent, if any, of the constituent monomers consists essentially of $C_8 - C_{12}$ monovinyl hydrocarbons, said copolymer being self-crosslinkable or employed in combination with a monomeric or polymeric cross-linking agent that is capable of reacting with said functional groups on said copolymer,

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3,932,350

METHOD OF MANUFACTURING REINFORCED RESIN MOLDINGS

Tadashi Yamaguchi; Takayuki Ono, both of Sendai; Hiroshi Hoshi, Narashino; Michio Hirakawa, and Isao Watanabe, both of Ichikawa, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 334,663, Feb. 22, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,479

Claims priority, application Japan, Feb. 24, 1972, 47-19543

Int. Cl.² C08K *3/34, 3/40*

U.S. Cl. 260—42.14 **11 Claims**

1. A method of manufacturing fiber-reinforced resin moldings, which comprises the steps of:

forming an aqueous dispersion consisting essentially of from one to 100 parts by weight of the sum of the weights of the following components A and B, per 100 parts by weight of aqueous dispersing medium,

A. fibers selected from the group consisting of glass fibers, slag wool fibers and asbestos fibers,

B. one or a mixture of α,β-ethylenically unsaturated, radical polymerizable monomers,

the weight ratio of A/B being such that the polymer-coated fibers obtained by the following polymerization step contain from 5 to 50 weight percent of polymer;

adding to said dispersion from 0.001 to 10 parts by weight of SO_2, per 100 parts by weight of said monomer B, as essentially the sole polymerization initiator made present in said dispersion, and maintaining said dispersion under polymerizing conditions effective to polymerize said monomer B, while agitating said dispersion, to form a polymer of B as a coating on the surfaces of fibers A,

recovering from the dispersion polymer-coated fibers composed of from 5 to 50 weight percent of polymer;

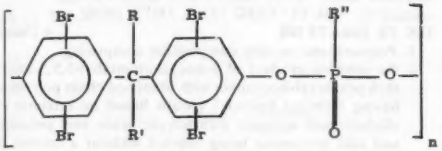
and then compression molding said polymer-coated fibers to form a molded object.

3,932,351
METHOD OF PREPARING PHOSPHORUS-BROMINE CONTAINING FIRE RETARDANT POLYESTER FIBERS

Henry L. King, Cary, N.C., assignor to Monsanto Company, Decatur, Ala.

Filed Apr. 8, 1971, Ser. No. 132,369. The portion of the term of this patent subsequent to Mar. 13, 1992, has been disclaimed.
Int. Cl.[2] C08K 5/53
U.S. Cl. 260—45.7 P 6 Claims

1. Synthetic fibers in which the fiber forming substance is any long chain synthetic polymer composed of at least 85% by weight of an ester of dihydric alcohol and terephthalic acid containing not more than 20% based on the weight of the polymer, of a compound having the general formula:



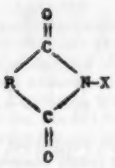
where R and R′ are radicals selected from the group consisting of hydrogen, methyl, ethyl, aryl, and brominated aryl; where R″ is a radical selected from the group consisting of alkyl, aryl, and brominated aryl; and where *n* is an integer of from 1 to about 100.

3,932,352
PHOTODEGRADABLE PLASTIC COMPOSITION CONTAINING A N-HALO IMIDE

Bernard Freedman, Berkeley, and Martin J. Diamond, Oakland, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 22, 1974, Ser. No. 453,911
Int. Cl.[2] C08K 5/16
U.S. Cl. 260—45.8 N 5 Claims

1. A photodegradable composition consisting of
a. a polyolefin selected from the group consisting of polyethylene, polypropylene, polybutylene, polystyrene, mixtures of polyethylene and polypropylene, and vinyl acetate/ethylene copolymers, and
b. about from 0.1 to 10% of an additive of the structure



wherein X is chlorine, bromine, or iodine, and R is a divalent hydrocarbon radical selected from the group consisting of an alkylene radical containing 1 to 8 carbon atoms, and the phenylene radical.

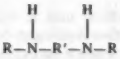
3,932,353
STABILIZERS FOR FUNCTIONALLY TERMINATED BUTADIENE POLYMERS

Edmund J. Mastrolia, Sacramento, and Harry J. Michigian, Carmichael, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

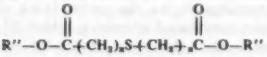
Filed Sept. 28, 1970, Ser. No. 90,200
Int. Cl. C08f 45/60, 45/62
U.S. Cl. 260—45.75 G 9 Claims

1. A novel composition comprising a polybutadiene polymer, said polymer bearing either pendant or terminal functional groups, a cross-linking agent reactive with said polybutadiene polymer, said cross-linking agent being selected from the group consisting of a polyisocyanate, an aziridine and an epoxide, and a stabilizer mixture including
1. a secondary amine having the formula

or



wherein R is a monovalent aromatic group and R′ is a divalent aromatic group; and
2. a thiodiester of the formula



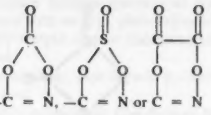
wherein R″ is a monovalent organic group and *n* is an integer from 1 to about 20.

3,932,354
STABILIZATION OF THERMOPLASTIC POLYURETHANES DERIVED FROM CYCLIC NITRILE COMPOUNDS

Larry G. Wolgemuth, Cherry Hill, and Benjamin C. Wilbur, Williamstown, both of N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 27, 1974, Ser. No. 445,522
Int. Cl.[2] C08L 75/00
U.S. Cl. 260—45.95 16 Claims

1. In a process for preparing polymers containing urethane, urea or thiourethane groups from cyclic nitrile compounds containing



groups and nucleophilic compounds having active hydrogen atoms using a catalyst system comprising an organotin compound, the improvement comprising heating the polymeric product with a tertiary alcohol containing 4 to 10 carbon atoms for ¼ to 24 hours and recovering the polymer from the tertiary alcohol by insolubilizing it in the tertiary alcohol.

3,932,355

PREPARATION OF SOL CHLOROPRENE POLYMERS

Arthur Livingston Barney, Wilmington, and Ausat Ali Khan, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 481,375, June 19, 1974, abandoned. This application Dec. 5, 1974, Ser. No. 530,035

Int. Cl.² C08G *2/00*; **C08F** *214/00, 136/16, 220/42*

U.S. Cl. 260—63 HA **10 Claims**

1. In the process of polymerizing to a high monomer conversion in the presence of a C_8-C_{20} alkyl mercaptan in aqueous emulsion at a pH of about 10–13, chloroprene in admixture with from 0 to about equal weight of a copolymerizable monomer at a temperature from the freezing point of the emulsion to about 52°C., the improvement of having present in the emulsion about 0.05–1 part by weight per 100 parts of the starting monomer, of a polyether having the following formula:

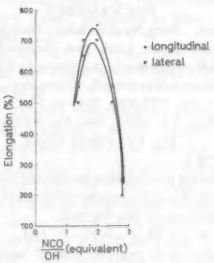
$$R^1—O(CH_2CHO)_nH$$
$$\quad\quad\quad

b. at least one polyester resin having an OH number of about 40 to 100, said polyester resin being the condensation product of at least one polyalcohol and at least one aromatic dicarboxylic acid or said condensation product having up to 30 mol % of said aromatic dicarboxylic acid replaced with at least one cycloaliphatic dicarboxylic acid, at least one aliphatic dicarboxylic acid or a mixture thereof, the quantity of polyoxazoline present being sufficient to provide about one oxazoline group for each free carboxyl group of the polyester.

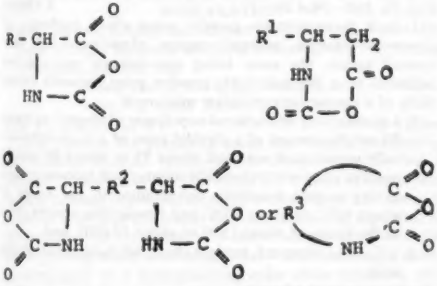
3,932,359
POLYURETHANES BASED ON AMINO-ACIDS OR DERIVATIVES THEREOF

Yasuo Fujimoto, Yokohama; Keizo Tatsukawa, Machida; Masayuki Teranishi, Machida; Shinsuke Koshimoto, Machida, all of Japan, and Toru Doiuchi, Dusseldorf, Germany, assignors to Kyowa Hakko Kogyo Co., Ltd., Japan

Continuation-in-part of Ser. No. 100,838, Dec. 22, 1970, abandoned. This application Aug. 29, 1973, Ser. No. 392,756
Claims priority, application Japan, Dec. 25, 1969, 44-103765
Int. Cl.² B32B 27/40; C08G 18/30, 18/64
U.S. Cl. 260—77.5 R 19 Claims



1. A process for producing an amino acid-urethane copolymer which comprises polymerizing (I) a prepolymer having isocyanate groups, which is prepared by reacting a polyether polyol having hydroxyl groups substantially at the terminals thereof selected from the group consisting of (a) ring-cleaved polymers of alkylene oxides having 2 to 8 carbon atoms, (b) mixtures of said ring-cleaved polymers, (c) condensates of said alkylene oxides and alkylene glycols having 2 to 6 carbon atoms and (d) condensates of one or more of said alkylene glycols with an organic polyisocyanate in a ratio in equivalent of the organic polyisocyanate to the polyether polyol of 1.6 to 2.5, with (II) an amino acid-N-carboxylic acid anhydride having the formula:



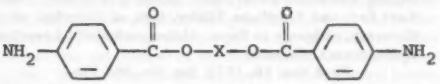
(wherein R and R^1 are hydrogen atoms or monovalent organic residues, and $R^2$and R^3 are divalent organic residues).

3,932,360
POLYURETHANE ELASTOMERS PREPARED FROM DIAMINE CURING AGENTS

Leon D. Cerankowski, Carlisle; Neil Mattucci, Billerica, and Richard C. Baron, North Andover, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 451,079, March 14, 1974, abandoned. This application Apr. 22, 1974, Ser. No. 462,763
Int. Cl.² C08G 18/32
U.S. Cl. 260—77.5 AM 21 Claims

1. A polyurethane product prepared by reacting an isocyanate terminated urethane prepolymer and a curing agent of the formula:



wherein X is a 2–12 carbon alkylene or cycloalkylene group.

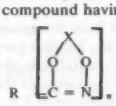
3,932,361
CATALYSTS FOR THE REACTION OF CYCLIC NITRILE COMPOUNDS WITH NUCLEOPHILIC COMPOUNDS

Donald H. Russell, Cherry Hill, N.J., and R. Warren Lenton, Glenolden, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

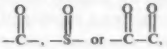
Continuation-in-part of Ser. No. 442,274, Feb. 13, 1974, abandoned. This application Nov. 21, 1974, Ser. No. 525,701
Int. Cl.² C08G 18/00
U.S. Cl. 260—77.5 B 14 Claims

1. A storage-stable urethane type polymer-forming composition in powdered form comprised of

A. A cyclic nitrile compound having the structural formula



wherein X is



R is an organic radical free of reactive hydrogens as determined by the Zerewitinoff Test and n is at least 2.

B. A nucleophilic organic compound having at least 2 reactive hydrogen-containing radicals selected from the group consisting of primary amino radicals, secondary amino radicals, hydroxy radicals, and mercapto radicals, and,

C. About 0.1 to 5% based on the total weight of A. and B. of a halide of a metal of Group IIb of the Periodic Table,

the cyclic nitrile compound and the nucleophilic compound being present in amounts such that the ratio of cyclic nitrile groups to reactive hydrogen containing groups is about 0.7 to 10:1.

3,932,362
AMORPHOUS POLYAMIDE OF C-ALKYL SUBSTITUTED DIAMINE AND TEREPHTHALIC ACID DIALKYL ESTER HAVING IMPROVED ELECTRICAL CREEP RESISTANCE

Johannes Schneider, and Wolfgang Pungs, both of Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation-in-part of Ser. No. 771,208, Oct. 28, 1968, abandoned. This application Apr. 13, 1972, Ser. No. 243,848
Claims priority, application Germany, Apr. 17, 1971, 2118753
Int. Cl.² C08Q 69/46
U.S. Cl. 260—78 S 7 Claims

1. A polyamide shaped object having an electrical creep resistance of quality Class KA 3b according to Deutsche Industrie Norm 53,480, said polyamide being an amorphous

polyamide of a C-alkyl substituted aliphatic diamine of hexane or octane and a terephthalic acid dialkyl diester said polyamide shaped object prepared by screw injection kneading a polyamide having a viscosity number determined in accordance with Deutsche Industrie Norm 53727 employing a 0.5 weight percent solution of polyamide in m-cresol at 25°C of 130–180, said polyamide being of a C-alkyl substituted aliphatic diamine of hexane or octane and a terephthalic acid dialkyl diester, under a back pressure of between 5 and 80 kiloponds/cm² at a temperature between 240° and 320°C.

3,932,363
POLYAMINES CONTAINING ACID GROUPS

Wolfgang Lehmann, Leverkusen; Gerhard Troemel, Pesch; Kurt Ley, and Friedhelm Müller, both of Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Nov. 10, 1972, Ser. No. 305,320

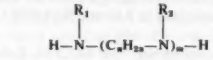
Claims priority, application Germany, Nov. 12, 1971, 2156215

Int. Cl.² C08G *69/44*

U.S. Cl. 260—78 SC **3 Claims**

1. A water-soluble modified polyamine having an average molecular weight of above 1,000 prepared by reacting

a. a polyamine of the formula



wherein

R_1 and R_2 is H or C_1–C_4 alkyl,

n is an integer of 2–4 and

m is an integer of 1–4, with

b. an alkanedicarboxylic acid of 4 to 10 carbon atoms, and with

c. a compound selected from the group consisting of acrylic acid, methacrylic acid, 2-chloropropionic acid, chloroacetic acid and alkali metal salts thereof;

and thereafter reacting the product of the reaction of (a), (b) and (c) with an α,ω-dihaloalkane of 2 to 6 carbon atoms in an aqueous medium at a pH above 6 and at a temperature between 0° and 95°C until the reaction mixture in the form of a 10% aqueous solution shows a viscosity of at least 10 cP at 25°C.

3,932,364
PRODUCTION OF POLYAMIDES IN THE PRESENCE OF A PHOSPHORUS ACID ESTER AND AN ORGANIC BASE

Noboru Yamazaki, and Fukuji Higashi, both of Tokyo, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 12, 1973, Ser. No. 405,906

Claims priority, application Japan, Oct. 17, 1972, 47-104297; Apr. 25, 1973, 48-47383; May 17, 1973, 48-55288

Int. Cl.² C08G *69/28*

U.S. Cl. 260—78 R **11 Claims**

1. A process for producing a fiber-forming polyamide which comprises reacting a dicarboxylic acid of the formula

$$HOOC-R^1-COOH$$

wherein R^1 is a straight or branched-chain aliphatic hydrocarbon radical, with a diamine of the formula

$$H_2N-R^2-NH_2$$

wherein R^2 is an aromatic carbocyclic radical, or a radical in which two or more aromatic carbocyclic radicals are bonded through —O—, in the presence of a phosphorous acid ester of the formula, $R^3R^4HPO_3$ wherein R^3 and R^4 may be same or different and are individually an alkyl, aralkyl or aromatic group and in the presence of an organic base selected from the group consisting of pyridine, 2-methyl pyridine, 4-methyl pyridine and 2,6-dimethyl pyridine, wherein one equivalent or more of the phosphorous acid ester is used per equivalent of the carboxyl group in the dicarboxylic acid and two moles or more of the organic base per mole of the dicarboxylic acid is used.

3,932,365
PREPARATION OF HIGH MOLECULAR WEIGHT POLYMER FROM OXALIC ACID AND PARA-PHENYLENE DIISOCYANATE

Rene Penisson, Lyon, France, assignor to Rhone-Poulenc-Textile, Paris, France

Filed Aug. 7, 1973, Ser. No. 386,315

Claims priority, application France, Aug. 9, 1972, 72.29010; May 28, 1973, 73.19614

Int. Cl.² C08G *18/76*

U.S. Cl. 260—78 R **11 Claims**

1. A process for the preparation of a high molecular weight film- and fiber-forming nitrogen-containing polymer, said process comprising reacting, in substantially stoichiometric amounts, oxalic acid and paraphenylene diisocyanate in a polar, aprotic, anhydrous, organic solvent at a temperature which is raised progressively at a rate of from about 1° to about 5°C per minute from a lower temperature of about 0° to about 30°C to a higher temperature of about 80°C to about 150°C, and in the presence, at least when the viscosity of the reaction mixture exceeds 6,000 poises, of a viscosity-reducing amount of a hydrogen bond breaking agent selected from the group consisting of lithium chloride and calcium chloride.

3,932,366
PROCESS FOR THE PRODUCTION OF BASIC MODIFIED POLYAMIDES

Wilhelm Thoma, Berg.Neukirchen; Dietrich Hildebrand, Odenthal; Wolf-Dieter Last, and Heinrich Rinke, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Division of Ser. No. 377,090, July 6, 1973. This application Dec. 13, 1974, Ser. No. 532,671

Int. Cl.² C08G *69/48*

U.S. Cl. 260—78 L **5 Claims**

1. Basic modified polyamides produced by the polycondensation of lactams of ω-aminocarboxylic acids together with 0.1 to 5 mol of triamines of the formula

$$H_2N-(CH_2)_n-NH-(CH_2)_n-NH_2$$

wherein *n* equals 2 to 6, per 100 mol of lactam and 2 equivalents of carboxyl groups in the form of dicarboxylic acids and monocarboxylic acids per mol of triamine, the molar ratio of said monocarboxylic acids to said dicarboxylic acids being of between 10 : 1 and 1 : 20, and said basic modified polyamides, dyed with reactive dyes.

3,932,367
POWDER PAINT WITH EPOXY AND HYDROXY COPOLYMER AND MIXTURE OF DICARBOXYLIC ACIDS AND POLYANHYDRIDES

Santokh S. Labana, Dearborn Heights, and Ares N. Theodore, Farmington, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 394,881, Sept. 6, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,457

Int. Cl.² C08G *59/42*, *81/02*; C08F *220/32*

U.S. Cl. 260—78.4 D **5 Claims**

1. In a thermosettable powder paint which exclusive of pigments, catalysts, antistatic agents, plasticizers and flow control agents, the same being conventional non-reactive additives to a thermosettable powder paint, consists essentially of a coreactive particulate mixture of

1. a qualitatively difunctional copolymer of about 5 to about 20 weight percent of a glycidyl ester of a monoethylenically unsaturated acid and about 95 to about 80 weight percent of monoethylenically unsaturated monomers and having a glass transition temperature in the range of about 40°C. to about 90°C. and a molecular weight (M_n) in the range of about 1500 to about 15,000, and
2. a C_4 – C_{20} saturated, straight chain, aliphatic dicarboxylic acid,

the improvement wherein

A. said copolymer is qualitatively difunctional and said other monoethylenically unsaturated monomers consist

essentially of difunctional monomers selected from the group consisting of $C_5 - C_7$ hydroxyalkyl acrylates and $C_5 - C_7$ hydroxyalkyl methacrylates in an amount comprising about 2 to about 10 weight percent of said copolymer and monofunctional monomers selected from the group consisting of esters of a $C_1 - C_8$ monohydric alcohol and acrylic acid, esters of a $C_1 - C_8$ monohydric alcohol and methacrylic acid and $C_8 - C_{12}$ monovinyl hydrocarbons, and

B. there is substituted for a portion of said dicarboxylic acid a polyanhydride having molecular weight in the range of about 1000 to about 5000 and the resultant mixture of said dicarboxylic acid and said polyanhydride is porportional and quantified such that said dicarboxylic acid is present in an amount that provides about 0.1 to about 0.6 carboxyl groups per epoxy group on said copolymer and said polyanhydride is present in an amount that provides about 0.2 to about 1.1 anhydride groups per epoxy group on said polymer.

3,932,368
POWDER COATING COMPOSITION COMPRISING A PARTICULATE FORM OF A CARBOXYLATED POLYOLEFIN

Richard L. McConnell; Robert B. Taylor, and Peter M. Grant, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 21, 1973, Ser. No. 418,160
Int. Cl.² C08F 8/46; C25D 13/06
U.S. Cl. 260—78.4 D **11 Claims**

1. A powder coating composition particularly useful in coating unprimed substrates which comprises a particulate form of a carboxylated polyolefin selected from the group consisting of carboxylated polyethylene compositions having a melt index of 5 to 75 at 190°C. and carboxylated homo- and copoly-α-olefins prepared from alpha olefin monomers containing 3 to 12 carbon atoms and copolymers of such monomers and ethylene having a melt flow rate of 15 to 175 g./10 minutes at 230°C., said polyolefin having a saponification number of about 2 to about 12, said particulate form having a particle size less than 20 mesh.

10. A substrate having thereon an electrostatically deposited coating comprising a particulate form of less than 20 mesh size of a carboxylated polyolefin selected from the group consisting of carboxylated polyethylene and carboxylated homo-and copoly-a-olefins prepared from alpha olefin monomers containing 3 to 12 carbon atoms and copolymers of such monomers and ethylene having a saponification number of about 2 to about 12, a melt flow of from about 15 to about 175 g./10 minutes at 230°C and a melt index of 5 to 75 at 190°C.

3,932,369
BLOCK COPOLYMERS CONTAINING OLEFIN SULFUR DIOXIDE SEGMENTS AND PROCESS FOR THEIR PREPARATION

Guido Sartori, Linden, and Robert D. Lundberg, Somerville, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Nov. 6, 1974, Ser. No. 521,454
Int. Cl.² C08F 28/00; C08G 75/22
U.S. Cl. 260—79.3 A **31 Claims**

1. A process for preparing block copolymers comprising olefin-sulfur dioxide blocks which comprises subjecting a polymer, which can be converted by means of shear into radical bearing segments, to shear at conditions wherein said polymer is broken down into free radical bearing segments, in the presence of the olefin, said olefin being a cis cycloolefin having a ring strain of at least about 4 kilocalories per mole, as compared to a corresponding open chain structure, and sulfur dioxide for a time sufficient to form a block copolymer comprising one or more of said polymer segments linked to a olefin-sulfur dioxide copolymer block.

3,932,370
POWDERED RUBBER

Vincent R. Landi, Chesire, and Richard W. Tomlinson, Watertown, both of Conn., assignors to Uniroyal Inc., New York, N.Y.

Filed Jan. 15, 1974, Ser. No. 433,616
Int. Cl.² C08D 5/02, 5/04
U.S. Cl. 260—83.3 **17 Claims**

1. In a method of treating rubber selected from the group consisting of butadiene-acrylonitrile copolymer rubber, styrene-butadiene copolymer rubber, polychloroprene rubber and polybutadiene rubber, wherein the rubber is chlorinated by contacting the rubber in an aqueous medium with hypochlorous acid as a chlorinating agent while agitating the mixture, the said chlorination being continued until the rubber has from 0.05 to 14 percent by weight of chlorine added thereto, the gel content of the thus-treated rubber being not greater than 95% by weight measured in methyl ethyl ketone for 24 hours at room temperature, the thus-treated rubber thereafter being separated from the aqueous medium and dried to provide friable or free-flowing rubber particles, the improvement comprising carrying out the said chlorination step while the said rubber is present as particles in the form of a slurry in the said aqueous medium, the said particles having a surface area of from 0.0022 to 0.0141 square meter per gram.

3,932,371
PROCESS FOR PREPARING LOW BULK VISCOSITY POLYMERS

Kenneth W. Powers, Berkeley Heights, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 22,813, March 6, 1970, abandoned, which is a continuation-in-part of Ser. No. 550,649, May 17, 1966, abandoned. This application Dec. 28, 1973, Ser. No. 429,129
Int. Cl.² C08F 2/06, 4/14, 4/52, 36/04
U.S. Cl. 260—85.3 R **9 Claims**

1. A two phase polymerization process for preparing an LM polymer which comprises reacting at polymerization conditions a C_4–C_8 conjugated diolefin with an isoolefin having the general formula:

wherein R_1 is H, a C_1–C_{12} acyclic hydrocarbyl radical or a C_1–C_{12} alicyclic hydrocarbyl radical and R_2 is a hydrocarbyl radical selected from the group consisting of phenyl, C_1–C_{12} acyclic radicals, C_1–C_{12} alicyclic radicals and mixtures thereof, in the presence of a catalyst selected from the group consisting of (1) aluminum bromide and (2) ethyl aluminum dichloride promoted with a compound selected from the group consisting of hydrogen chloride, C_3–C_7 organic halides, and mixtures thereof, said catalyst being dissolved in a C_5–C_9 alkane; said polymerization being carried out in a vehicle wherein said vehicle is (1) propane or (2) propane plus a C_5–C_9 alkane, the reaction being carried out continuously with the steady-state concentration of monomers to be polymerized plus C_5–C_9 alkane is about 4 to about 23 weight percent based on monomers plus propane, plus C_5–C_9 alkane, the polymerization being carried out at a temperature of about −30 to about −80°C. and the polymerization being carried out at a conversion rate of about 60 to about 90%.

3,932,372
PEROXIDE CO-INITIATOR SYSTEM FOR POLYMERIZATION

Roger N. Lewis, Pinole, and Ronald L. Friedman, San Rafael, both of Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Continuation of Ser. No. 56,714, July 20, 1970, abandoned. This application Nov. 15, 1973, Ser. No. 415,877

Int. Cl.² C08F *114/02, 114/16*

U.S. Cl. 260—92.8 W **5 Claims**

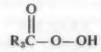
1. An improved method for polymerization of addition polymerizable monomers having ethylenic unsaturation, comprising:

combining in an suitable liquid, said monomer, a catalytic polymerization composition consisting of a first initiator, which is a symmetrical diacyl peroxide of the formula:

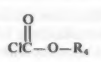
wherein:

R_3 is branched or straight chain alkyl, aryl, cycloalkyl, and substituted derivatives thereof;

a peracid of the formula:

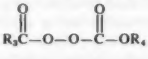


and a chloroformate of the formula:



wherein:

R_3 and R_4 are selected from branched or straight chain alkyl, cycloalkyl, and substituted derivatives thereof, and wherein R_3 can additionally be aromatic, in the presence of sufficient base to neutralize the hydrochloric acid generated by the reaction of said peracid and said chloroformate to form as a second initiator:



wherein:

R_3 and R_4 have been defined previously; and

maintaining the mixture at a temperature and for a sufficient time to substantially polymerize said monomer.

3,932,373
POLYMERIC MATERIALS DERIVED FROM RING-OPENING POLYMERIZATION OF 1,5-CYCLOOCTADIENE

Nissim Calderon, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 272,612, July 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 145,953, May 21, 1971, abandoned, which is a continuation of Ser. No. 785,032, Dec. 10, 1968, abandoned, which is a continuation of Ser. No. 477,035, Aug. 3, 1965, abandoned, which is a continuation-in-part of Ser. No. 448,872, April 16, 1965, abandoned. This application Mar. 4, 1974, Ser. No. 448,149

Int. Cl.² C08F *132/06*

U.S. Cl. 260—93.1 **4 Claims**

1. Rubbery homopolymers of 1,5-cyclooctadiene prepared by ring-opening polymerization of 1,5-cyclooctadiene, characterized by having a structure of polyalkenamers in which the double bonds are of the cis and trans vinylene type of configuration and none of the double bonds are of the 1,2 type configuration.

3,932,374
BLEOMYCINIC ACID AND PROCESS FOR PREPARING THEREOF

Hamao Umezawa, Tokyo; Yasushi Takahashi, Hoya; Tadashi Shirai, Musashino, and Akio Fujii, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

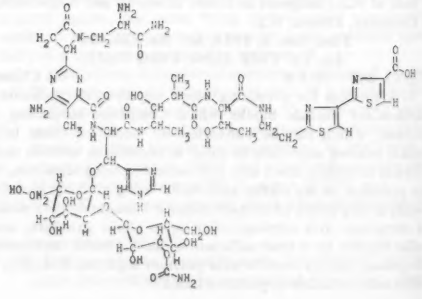
Division of Ser. No. 290,986, Sept. 21, 1972, Pat. No. 3,867,257, which is a continuation-in-part of Ser. No. 252,252, May 11, 1972, Pat. No. 3,843,448. This application June 13, 1974, Ser. No. 479,087

Claims priority, application Japan, May 15, 1971, 46-32232

Int. Cl.² C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **2 Claims**

1. A compound having the structure of:



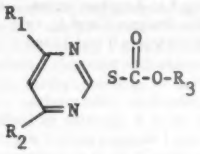
3,932,375

USE OF 2-PYRIMIDINE THIOL CARBONATES AS ACYLATING AGENTS FOR AMINO OR IMINO CONTAINING COMPOUNDS

Takeshi Nagasawa; Katumasa Kuroiwa, and Kouichi Narita, all of Korujama, Japan, assignors to Nitto Boseki Co. Ltd., Fukushima, Japan

Division of Ser. No. 287,410, Sept. 8, 1972, Pat. No. 3,852,290. This application June 13, 1974, Ser. No. 479,188
Claims priority, application Japan, Sept. 17, 1971, 46-72261; Sept. 27, 1971, 46-75306; Sept. 30, 1971, 46-76555; Jan. 10, 1972, 47-5116
Int. Cl.² C07C *103/52*
U.S. Cl. 260—112.5 R 14 Claims

1. A method for using a thiolcarbonate represented by the formula,



(I)

wherein R_1 and R_2 are individually a hydrogen atom or a methyl group, and R_3 is a straight chain or branched chain alkyl group having 1 to 5 carbon atoms, a straight chain or branched chain alkenyl group having 2 to 5 carbon atoms, or benzyl or benzhydryl group which may be nuclear substituted by a methoxy or nitro group of one or more halogen atoms,

as an acylating agent for acylating the amino or imino group of a compound having amino and/or imino groups selected from the group consisting of aliphatic, aralkyl, alicyclic, aromatic and heterocyclic primary and secondary amines; hydrazines and derivatives thereof; amino acids, and peptides obtained from two or more of the said amino acids and derivatives thereof; and saccharides and steroids having amino and/or imino groups;

in an inert organic solvent or in an aqueous solution thereof in the presence or absence of a base under mild conditions.

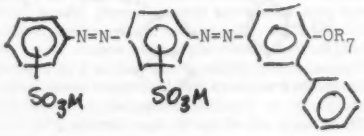
3,932,376

SULFO PHENYL-AZO-SULFO PHENYL-AZO-ALKOXY-DIPHENYL COMPOUNDS

James F. Feeman, Wyomissing, Pa., assignor to Crompton & Knowles Corporation, Worcester, Mass.

Filed Oct. 6, 1971, Ser. No. 187,150
Int. Cl.² C09B *43/00, 31/06*
U.S. Cl. 260—186 2 Claims

1. A compound having the structure:



wherein M is H, Na, K, Li and NH_4; and R_7 is lower alkyl.

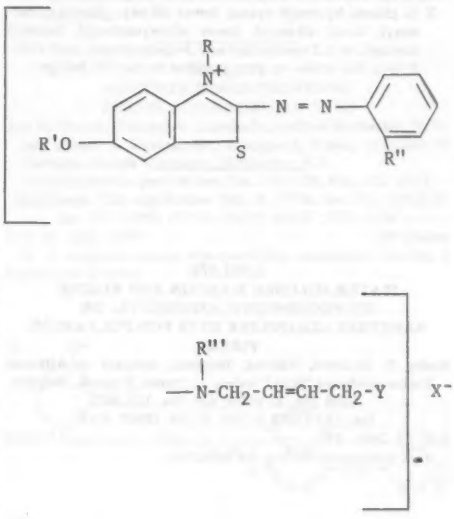
3,932,377

HYDROSOLUBLE MONOAZOIC CATIONIC DYES AND PROCESS FOR PREPARING SAME

Fabrizio Merlo, Saronno (Varese); Ruggero Battisti, Novara, and Danilo Domenis, Saronno (Varese), all of Italy, assignors to Montecatini Edison S.p.A. and Aziende Colori Nazionali Affini Acna S.p.A., both of Milan, Italy

Continuation of Ser. No. 203,861, Dec. 1, 1971, abandoned. This application Dec. 6, 1973, Ser. No. 422,352
Int. Cl.² C09B *29/08*; D06P *3/76*
U.S. Cl. 260—158 11 Claims

1. A water soluble, azoic, cationic dye having the formula:



wherein:

R is methyl or ethyl;

R′ is alkyl having from 1 to 4 carbon atoms;

R″ is hydrogen, alkyl having from 1 to 4 carbon atoms, or halogen;

R‴ is alkyl having from 1 to 4 carbon atoms, or C_1–C_4 alkyl substituted by a halogen, cyano or hydroxy;

Y is cyano or acetoxy; and

X is an anion.

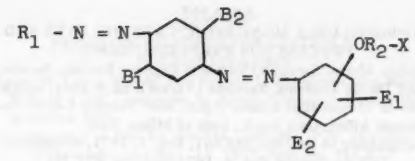
3,932,378

SULFONATED DISAZO DYESTUFFS CONTAINING AN ETHER GROUP

Alfred Fasciati, Bottmingen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Aug. 18, 1971, Ser. No. 172,877
Claims priority, application Switzerland, Aug. 25, 1970, 12647/70; Aug. 11, 1971, 11798/71
Int. Cl.² C07C *107/06*
U.S. Cl. 260—174 10 Claims

1. A disazo compound of the formula



in which R_1 is mono- or disulfonated phenyl or naphthyl which, in addition to said sulfo groups is further unsubstituted or substituted by chlorine, lower alkyl or lower alkoxy,

B_1, B_2, E_1 and E_2 each is hydrogen, lower alkyl or lower alkoxy,

R_3 is low molecular alkylene, vinylene or propylene,

X is chloro hydroxyl cyano, lower alkoxy, phenoxy, carboxyl, lower alkanoyl, lower alkoxycarbonyl, benzoyl benzoyl, or 1,2 epoxyethyl or 2,3-epoxypropyl, and $-OR_3-X$ is in the ortho- or para-position to the azo bridge.

3,932,379

WATER-SOLUBLE MAROON AND RUBINE SULPHODIPHENYLAZOPHENYL- OR NAPHTHYLAZOANILINE DYES FOR POLYAMIDE FIBERS

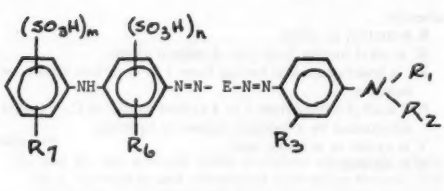
Andre T. Brulard, Villerot, Belgium, assignor to Althouse Tertre en abrege "Atsa" societe anonyme, Brussels, Belgium

Filed Jan. 4, 1973, Ser. No. 320,848

Int. Cl.[2] C09B *31/04, 31/08;* **D06P** *3/24*

U.S. Cl. 260—191 **4 Claims**

1. A compound having the structure:



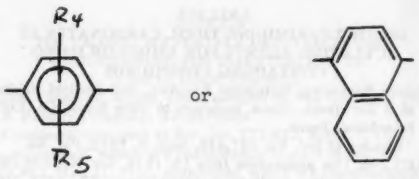
wherein

R_1 represents hydrogen alkyl having 1 to 4 carbon atoms, or alkyl having 1 to 4 carbon atoms substituted by cyano or hydroxy;

R_2 represents alkyl having 1 to 4 carbon atoms, or alkyl having 1 to 4 carbon atoms substituted by cyano, hydroxy, phenyl or phenyl substituted with a sulfonic acid group;

R_3 represents hydrogen, alkyl having 1 to 4 carbon atoms, or alkoxy having 1 to 4 carbon atoms;

E represents:



wherein R_4 and R_5 may be the same or different from each other and represent hydrogen, alkyl having 1 to 4 carbons or alkoxy having 1 to 4 carbon atoms;

R_6 represents hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, $-NO_2$ or halogen;

R_7 represents hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, $-NO_2$ or halogen;

m represents the integers 0 and 1;

n represents the integers 0 and 1; and

$m + n = 1$.

3,932,380

MAGENTA IMAGE-PROVIDING PHENYLAZO-NAPHTHYL DYES

James J. Krutak, Sr., Kingsport, Tenn.; Jan R. Haase, and Richard A. Landholm, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

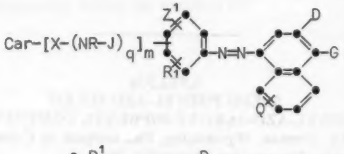
Filed Feb. 5, 1974, Ser. No. 439,787

Int. Cl.[2] C09B *29/10, 29/20;* **G03C** *5/30, 5/54*

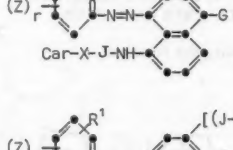
U.S. Cl. 260—197 **12 Claims**

1. A magenta image dye-providing compound having a formula as follows:

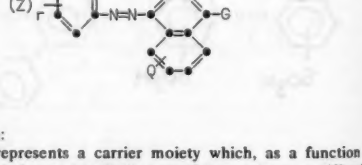
I.



II.

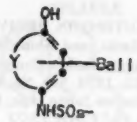


III.



wherein:

Car represents a carrier moiety which, as a function of oxidation under alkaline conditions, releases a diffusable dye from said compound and having the formula



wherein

Ball represents an organic ballasting group containing at least 8 carbon atoms which renders said compound non-diffusible in a photographic element during development in an alkaline processing composition;

Y represents the carbon atoms necessary to complete a benzene or naphthalene nucleus;

m and *q* each represent an integer having a value of 0 or 1;

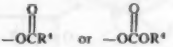
X represents a bivalent linking group of the formula $-R^2-L_n-R_p^2-$ where each R^2 can be the same or different and each represents alkylene having 1 to 8 carbon atoms; phenylene; or phenylene substituted with chloro, bromo, cyano, nitro, methoxy, methyl, carboxy or sulfo; L represents oxy, carbonyl, carboxamido, carbomoyl, sulfonamido, sulfamoyl sulfinyl or sulfonyl; *n* is an integer having a value of 0 to 1; *p* is 1 when *n* equals 1 and *p* is 1 or 0 when *n* equals 0 or when *q* is 0; Car-X- represents Car-alkylene-SO_2-, Car-$C_6H_4CH_2SO_2$-, or Carphenylene-SO_2-, provided that the carbon content of X does not exceed 14 carbon atoms;

R represents hydrogen or alkyl having 1 to 6 carbon atoms;

J represents sulfonyl or carbonyl;

Q is in the 5- or 8-position relative to G and represents hydroxy, $-NHCOR^3$ or $-NHSO_2R^3$ wherein R^3 is alkyl having 1 to 6 carbon atoms, alkyl having 1 to 6 carbon atoms substituted with hydroxy, cyano, sulfamoyl, carboxyl or sulfo; benzyl, phenyl, or phenyl substituted with carboxy, cyano, chloro, methoxy, methyl or sulfamoyl;

G represents hydroxy, an alkali metal salt thereof, a photographically inactive amine salt thereof, or a hydrolyzable acyloxy group having the formula:



wherein

R^4 is alkyl having 1 to 18 carbon atoms, phenyl or phenyl substituted with chloro or nitro;

r represents an integer having a value of 1 or 2;

Z represents cyano, trifluoromethyl, fluorosulfonyl, carboxy, $-COOR^4$ wherein R^4 is as described previously, nitro in the 2- or 3-position relative to the azo linkage, fluoro, chloro or bromo, alkylsulfonyl having 1 to 7 carbon atoms, alkylsulfonyl having 1 to 8 carbon atoms substituted with hydroxy, phenyl, cyano, sulfamoyl, carboxy or sulfo; phenylsulfonyl, phenylsulfonyl substituted with sulfamoyl, carboxy, fluorosulfonyl or methoxy; alkylcarbonyl having 2 to 5 carbon atoms, $-SO_2NR^5R^6$ wherein R^5 represents hydrogen, alkyl having 1 to 8 carbon atoms; R^6 represents hydrogen, alkyl having 1 to 6 carbon atoms, alkyl having 1 to 6 carbon atoms substituted with hydroxy, cyano, fluorosulfonyl, carboxy or sulfo; benzyl, phenyl, phenyl substituted with hydroxy, sulfonyl, sulfamoyl, carboxy or sulfo; alkylcarbonyl having 2 to 7 carbon atoms, phenylcarbonyl, alkylsulfonyl having 1 to 6 carbon atoms, alkylsulfonyl having 1 to 6 carbon atoms substituted with cyano or hydroxy; phenylsulfonyl or methoxyphenylsulfonyl; or Z represents $-CON(R^5)_2$ wherein each R^5 can be the same or different and is as described previously;

Z^1 represents hydrogen or Z;

R^1 represents hydrogen, alkyl having 1 to 4 carbon atoms, alkyl having 1 to 4 carbon atoms substituted with cyano, hydroxy or methoxy; alkoxy having 1 to 4 carbon atoms, chloro, bromo or fluoro;

D represents cyano, sulfo, fluorosulfonyl, chloro, bromo, fluoro, $-SO_2$-phenyl or $-SO_2$-phenyl substituted with hydroxy, chloro, carboxy, sulfamoyl, methyl or methoxy; alkylsulfonyl having 1 to 8 carbon atoms, alkylsulfonyl having 1 to 8 carbon atoms substituted with chloro, fluoro, hydroxy, phenyl, cyano, phenylsulfonyl or phenylsulfonyl substituted with carboxy, fluorosulfonyl or methoxy; alkylsulfinyl having 1 to 8 carbon atoms or alkylsulfinyl having 1 to 8 carbon atoms substituted with cyano, phenyl, hydroxy or sulfamoyl; phenylsulfinyl or phenylsulfinyl substituted with sulfo or fluorosulfonyl, $-SO_2NR^5R^6$, or $-CON(R^5)_2$ wherein each R^5 and R^6 is as described previously for Z,

with the proviso that there be no more than one sulfo radical and no more than one carboxy radical present in said compound.

3,932,381
MAGENTA IMAGE-PROVIDING PHENYLAZO-NAPHTHYL DYES

Jan R. Haase; Richard A. Landholm, both of Rochester, N.Y., and James J. Krutak, Sr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

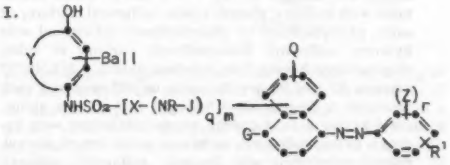
Continuation-in-part of Ser. No. 331,729, Feb. 12, 1973, abandoned. This application Feb. 5, 1974, Ser. No. 439,810

Int. Cl.² C09B *29/10, 29/20;* **G03C** *5/30, 5/54*

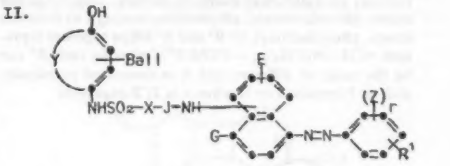
U.S. Cl. 260—197 **20 Claims**

1. A magenta image dye-providing compound having a formula as follows:

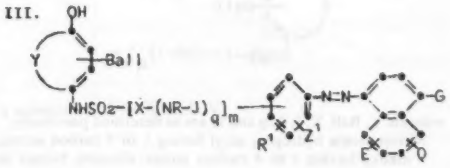
I.



II.



III.



wherein

Ball represents an organic ballasting group containing at least 8 carbon atoms which renders said compound non-diffusible in a photographic element during development in an alkaline processing composition.

Y represents the carbon atoms necessary to complete a benzene or naphthalene nucleus;

m and *q* each represent an integer having a value of 0 or 1;

X represents $—R^2—L_n—R^2p—$ where each R^2 can be the same or different and each represents alkylene having 1

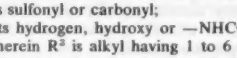
to 8 carbon atoms; phenylene; or phenylene substituted with chloro, bromo, cyano, nitro, methoxy, methyl, carboxy or sulfo; L represents oxy, carbonyl, carboxamido, carbamoyl, sulfonamido, sulfamoyl, sulfinyl or sulfonyl; n is an integer having a value of 0 or 1; *p* is 1 when *n* equals 1 and *p* is 1 or 0 when *n* equals 0 or when *q* is 0, L is sulfonyl and *n* is 1, then *p* is 0, provided that when *p* is 1 the carbon content of the sum of both R^2 radicals does not exceed 14 carbon atoms;

R represents hydrogen, or alkyl having 1 to 6 carbon atoms;

J represents sulfonyl or carbonyl;

Q represents hydrogen, hydroxy or —NHCOR³ or —NHSO₂R³ wherein R^3 is alkyl having 1 to 6 carbon atoms, alkyl having 1 to 4 carbon atoms substituted with hydroxy, cyano, sulfamoyl, carboxy, or sulfo; benzyl, phenyl or phenyl substituted with carboxy, chloro, methyl, methoxy or sulfamoyl;

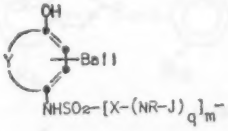
G represents hydroxy, an alkali metal salt thereof, a photographically inactive amine salt thereof or hydrolyzable acyloxy group having the formula



wherein R^4 is alkyl having 1 to about 18 carbon atoms, phenyl or phenyl substituted with chloro or nitro having 6 to 18 carbon atoms;

r represents an integer having a value of 1 or 2;

Z represents cyano, trifluoromethyl, carboxy, —COOR⁴ wherein R^4 is as described previously, nitro in the 2- or 3-position relative to the azo linkage, fluorosulfonyl, sulfo, chloro, bromo, fluoro, alkylsulfonyl having 1 to 8 carbon atoms, alkylsulfonyl having 1 to 6 carbon atoms substituted with hydroxy, phenyl, cyano, sulfamoyl, carboxy or sulfo; phenylsulfonyl or phenylsulfonyl substituted wiht hydroxy, sulfamoyl, fluorosulfonyl, carboxy or sulfo; alkylcarbonyl having 2 to 5 carbon atoms, $—SO_2NR^5R^6$ wherein R^5 and R^6 are the same or different and each represent hydrogen, alkyl having 1 to 6 carbon atoms, alkyl having 1 to 4 carbon atoms substituted with hydroxy, cyano, sulfamoyl, carboxy or sulfo; benzyl, phenyl, phenyl substituted with hydroxy, sulfamoyl, sulfonyl, carboxy or sulfo; alkylcarbonyl having 2 to 7 carbon atoms, phenylcarbonyl, alkylsulfonyl having 1 to 6 carbon atoms, phenylsulfonyl, or R^5 and R^6 taken together represent =CH—N(CH₂)₂ ; —CON(R⁵)₂ wherein each R^5 can be the same or different and is as described previously; and, in Formulas I or II when *r* is 1, Z represent



wherein Y, Ball, X, J, R, *q* and *m* are as described previously;

R^1 represents hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, chlooro, bromo or fluoro;

E is in the 5-, 6- or 7-position relative to G and represents hydrogen, carboxy, —COOR⁴ wherein R^4 is as described previously, sulfo, $—SO_2NR^5R^6$, —CON(R⁵)₂ wherein R^5 and R^6 are as described previously, alkylsulfonyl having 1 to 8 carbon atoms, alkylsulfonyl having 1 to 8 carbon atoms substituted with cyano, hydroxy, sulfamoyl, phenyl or sulfo; phenylsulfonyl or phenylsulfonyl substituted with sulfo, carboxy, fluorosulfonyl or methoxy;

Z^1 represents hydrogen or Z;

with the proviso that there be no more than one carboxy present in said compound.

3,932,382

DIDEOXYBUTIROSIN DERIVATIVE

Eiji Ohki; Hiromichi Saeki, and Shinichi Sugawara, all of Tokyo, Japan, assignors to Sankyo Company Limited, Japan

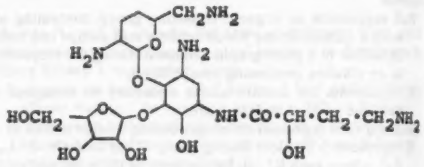
Filed Mar. 28, 1974, Ser. No. 455,943

Claims priority, application Japan, Apr. 11, 1973, 48-41175

Int. Cl.² C07H *15/22*

U.S. Cl. 260—210 AB **3 Claims**

1. 3′, 4′-Dideoxybutirosin A having the formula



and its pharmaceutically acceptable acid addition salt.

3,932,383

9-DIHYDRONIDDAMYCIN A COMPOUNDS AND RELATED 3-(O)-ESTERS AND THE PROCESS FOR THEIR PREPARATION

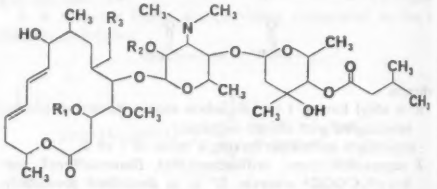
Leslie Alan Freiberg, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed June 3, 1974, Ser. No. 476,015

Int. Cl.² C07G *3/00*

U.S. Cl. 260—210 AB **24 Claims**

1. A 9-dihydroniddamycin A compound having the structural formula:



wherein R_1 and R_2 are the same or different member of the group consisting of hydrogen, HCO, CH_3CO, C_2H_5CO or C_3H_7CO; and wherein R_3 is CHO or $CH(OCH_3)_2$.

3,932,384

DIBENZAZECINES

Yoshiro Sawa, Ashiya; Katsumi Hirose, Nishinomiya; Shin Maeda, and Yoshinori Hamada, both of Amagasaki, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

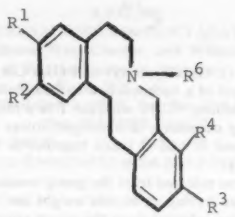
Filed July 27, 1973, Ser. No. 383,148

Claims priority, application Japan, Aug. 17, 1972, 47-82399; Aug. 17, 1972, 47-82400; Sept. 26, 1972, 47-96368

Int. Cl.² C07D *225/08, 491/04*

U.S. Cl. 260—239 D **8 Claims**

1. A compound of the formula:



wherein R^1 and R^2 are each selected from the group consisting of hydrogen, hydroxy and hydroxymethyl; one of R^3 and R^4 is selected from the group consisting of hydrogen, hydroxy and methoxy and the other is selected from the group consisting of hydroxy and methoxy and R^6 is selected from the group consisting of hydrogen, methyl, cyclopropylmethyl and benzyl.

3,932,385

PENICILLINS HAVING A 6β-(α-ETHERIFIED OXIMINO) ACYLAMIDO GROUP

Martin Christopher Cook; Gordon Ian Gregory, both of Chalfont St. Peter, and Janice Bradshaw, Harrow, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

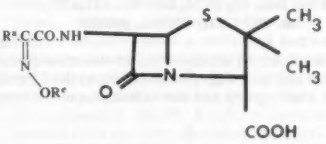
Continuation-in-part of Ser. No. 252,846, May 12, 1972, abandoned. This application Nov. 7, 1972, Ser. No. 304,501

Claims priority, application United Kingdom, May 14, 1971, 15082/71

Int. Cl.² C07D *501/20*

U.S. Cl. 260—239.1 **20 Claims**

1. A penicillin antibiotic of the formula



wherein R^a is naphthyl; thienyl; benzothienyl or any of these groups substituted by chlorine, bromine, iodine, fluorine, hydroxy, lower alkyl, nitro, amino, lower alkylamino, diloweralkylamino, lower alkanoyl, lower alkanoylamino, lower alkoxy, lower alkylthio or carbamoyl and R^e is alkyl of 1–16 carbon atoms; alkenyl of 2–16 carbon atoms; alkynyl of 2–16 carbon atoms; cycloalkyl of 3–7 carbon atoms; cycloalkenyl of 4–7 carbon atoms; phenyl; naphthyl; a heterocyclic radical selected from the group consisting of thienyl; furyl; pyridyl; pyrimidyl; pyrrolyl; N-methylpyrrolyl; N-benzyloxymethylpyrrolyl; thiazolyl; isothiazolyl; diazolyl; triazolyl; tetrazolyl; thiadiazolyl; thiatriazolyl; oxazolyl; oxadiazolyl; 3- or 4-isoxazolyl; sydnone; benzothienyl; benzofuryl; indolyl; benzimidazolyl; benzoxazolyl and purinyl; phenyl lower alkyl; diphenylmethyl; triphenylmethyl; naphthyl lower alkyl; heterocyclic lower alkyl in which the heterocyclic moiety is derived from said heterocyclic radical, or any of these groups substituted by hydroxy, lower alkoxy, phenoxy, benzyloxy, mercapto, lower alkylthio, phenylthio, benzylthio, amino, chlorine, bromine, iodine, fluorine, nitro, azido, carboxy, lower carbalkoxy, formyl, acetyl, propionyl, benzoyl, acetoxy, propionyloxy, pivaloyloxy, cyano, phthalimido, acetamido, benzamido, lower alkoxycarbonylamino or benzyloxycarbonylamino; or a physiologically acceptable salt thereof.

3,932,386

SODIUM 6-(L-AMINOCYCLOHEXANE CARBOXAMIDO)PENICILLANIC ACID

John J. Nescio, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed June 18, 1973, Ser. No. 370,909

Int. Cl.² C07D *499/44*

U.S. Cl. 260—239.1 **11 Claims**

1. Crystalline sodium 6-(1-aminocyclohexanecarboxamido)-penicillanate.

3,932,387

PROCESS FOR THE CONVERSION OF 3-METHYL-3-HYDROXYCEPHAM COMPOUNDS

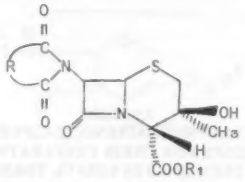
Stjepan P. Kukolja, Indianapolis, and Steven R. Lammert, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 267,796, June 30, 1972, abandoned. This application Mar. 27, 1974, Ser. No. 455,444

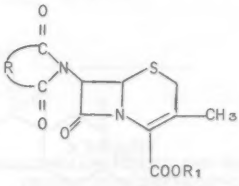
Int. Cl.² C07D *501/04*

U.S. Cl. 260—239.1 **14 Claims**

1. Process for converting a 3-methyl-3-hydroxycepham compound, which comprises the step of reacting a compound of the formula

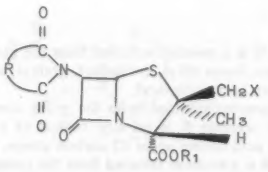


with a halogen reagent selected from the group consisting of PX_5 and SOX_2 in the presence of at least about one mole of an alkaline reagent selected from the group consisting of a tertiary amine and an inorganic alkaline salt per each mole of the 3-methyl-3-hydroxycepham compound and at a temperature within the range of from about 60°C. to about 150°C. to obtain a mixture of a compound of the formula IV



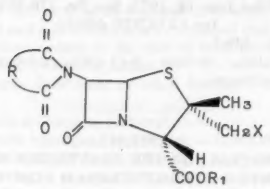
IV

a compound of the formula V



V

and a compound of the formula VI



VI

in which, in the above formulae, R is the residue of an imide derived from a dicarboxylic acid, R_1 is a carboxy protecting group and X is chlorine or bromine.

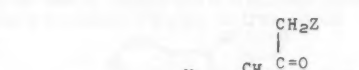
3,932,388

6-AZIDO-4,6-PREGNADIENO[3,2-C]PYRAZOLES, PROCESSES FOR THEIR PREPARATION AND INTERMEDIATES USEFUL THEREIN

Thomas L. Popper, West Caldwell; Richard W. Draper, East Orange; Elliot L. Shapiro, Cedar Grove, and Arthur S. Watnick, South Orange, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Apr. 22, 1974, Ser. No. 462,687
Int. Cl.[2] C07J *1/00*
U.S. Cl. 260—239.55 R **26 Claims**

1. A compound selected from the group consisting of a 6-azido-4,6-pregnadieno [3,2-c]pyrazole of the following formula:



wherein G is a member selected from the group consisting of hydrogen, lower alkyl, cycloalkyl, aralkyl, aryl and lower hydrocarbon carboxylic acyl;

Q is a member selected from the group consisting of hydroxy, OR wherein R is an acyl radical of a hydrocarbon carboxylic acid having up to 12 carbon atoms, and hydrogen provided W is a member selected from the group consisting of hydrogen and (H, lower alkyl);

W is a member selected from the group consisting of

(H, lower alkyl), (H,α-hydroxy) and (H,α-OR_1), wherein R_1 is an acyl radical of a hydrocarbon carboxylic acid having up to 12 carbon atoms, =CHT wherein T is a member selected from the group consisting of hydrogen, lower alkyl, fluorine and chlorine and W and Q taken together is 16α,17α-lower alkylidenedioxy;

X is a member selected from the group consisting of hydrogen and halogen having an atomic weight less than 100;

Y is a member selected from the group consisting of

provided X is hydrogen, oxygen, (H,βOH), (H,βOCOH), and (H,β-halogen of atomic weight less than 100) providing X is halogen;

Z is a member selected from the group consisting of hydrogen, hydroxy, halogen having an atomic weight up to 40, OR_2 wherein R_2 is an acyl radical of an acid selected from the group consisting of a hydrocarbon carboxylic acid having up to 12 carbon atoms, phosphoric acid and the mono- and di-alkali and alkaline earth metal salts thereof, and Z together with Q is a member selected from the group consisting of alkylidenedioxy and alkyl orthoalkanoate.

3,932,389

2-DESCARBOXY-2-[TETRAZOL-5-YL]-11-DESOXY-15-SUBSTITUTED-ω-PENTANORPROSTAGLANDINS

Michael R. Johnson, Gales Ferry; Thomas K. Schaaf, Old Lyme; Jasjit S. Bindra, Groton; Hans-Jurgen E. Hess, Old Lyme, and James F. Eggler, Stonington, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Dec. 11, 1974, Ser. No. 531,675
Int. Cl.[2] C07D *257/06, 409/08*
U.S. Cl. 260—240 R **37 Claims**

1. 2-descarboxy-2-[tetrazol-5-yl]-11-desoxy-ω-pentanorprostaglandins and their C_{15} epimers having at the 15-position a hydroxy or a keto group and one substituent of the formula:

wherein Ar is α- or β-thienyl; 5-phenyl-α- or β-thienyl; 5-lower alkyl-α- or β-thienyl; α- or β-naphthyl; tropyl, phenyl; 3,5-dimethylphenyl; 3,4-dimethoxyphenyl; 3,4-methylenedioxyphenyl; 3,4-dichlorophenyl; and monosubstituted phenyl wherein said substituent is bromo, chloro, fluoro, trifluoromethyl, phenyl, lower alkyl, or lower alkoxy; and R is hydrogen or methyl.

3,932,390

2-THIA-1,3,5-TRIAZA-7-PHOSPHAADAMANTANE 2,2-DIOXIDE

Donald J. Daigle, New Orleans; Armand B. Pepperman, Jr., Metairie, and Gordon J. Boudreaux, New Orleans, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 471,516, May 20, 1974, Pat. No. 3,899,618. This application Apr. 29, 1975, Ser. No. 572,802
Int. Cl.[2] C07D *285/00*
U.S. Cl. 260—243 R **3 Claims**

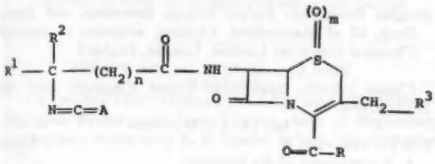
1. 2-Thia-1,3,5-triaza-7-phosphaadamantane 2,2-dioxide.

3,932,391
CEPHALOSPORIN ISOCYANATES

Harvey E. Alburn, West Chester, and William Dvonch, Radnor, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 2, 1972, Ser. No. 294,411
Int. Cl.² C07D 501/20
U.S. Cl. 260—243 C 18 Claims

1. A compound selected from the group having the formula:



wherein

R^1 is selected from the group consisting of phenyl, substituted phenyl, naphthyl, substituted naphthyl, wherein the substituted phenyl and substituted naphthyl is substituted with a group selected from the class consisting of nitro, halogen, trifluoromethyl, (lower)alkoxy, (lower) alkyl, amino, hydroxy, sulfamyl, di(lower)alkylamino and (lower) alkanoylamino, a cycloalkyl, having from four to eight ring atoms, cycloalkenyl having from four to eight ring atoms and an alicyclic group having from six to eight carbon atoms and containing two or three conjugated or non-conjugated double bonds, a heterocyclic radical selected from the class consisting of thienyl, furyl, pyridyl and pyrimidinyl, R^2 is hydrogen or lower alkyl having from one to six carbon atoms

R^3 is selected from the class consisting of hydrogen, pyridinium and an alkanoyloxy radical derived from a hydrocarbon carboxylic acid having from one to eight carbon atoms;

A is sulfur or oxygen;

R is

wherein R^5, R^6 and R^7 are selected from the group consisting of lower alkyl, aryl(lower)alkyl, wherein the aryl portion is phenyl or naphthyl, cycloalkyl of 5 to 8 carbon atoms, phenyl and naphthyl;

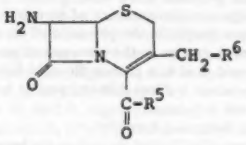
m is either 0 or 1, *n* is a whole number from 0 to 3.

3,932,392
PROCESS FOR THE PREPARATION OF 7-AMINOCEPHALOSPORANIC ACIDS

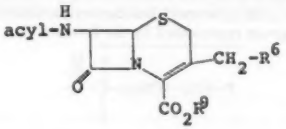
David A. Johnson, Fayetteville; Steven P. Brundidge, Wolcott; Albert L. Vulcano, Liverpool; Chester Sapino, Jr., East Syracuse; James Mahan, and Joseph H. Grossman, both of Syracuse, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Jan. 14, 1974, Ser. No. 433,336
Int. Cl.² C07D 279/08, 501/18
U.S. Cl. 260—243 C 11 Claims

1. In the process for the preparation of a compound having the formula



in which R^6 is H or acetoxy and R^5 is OH or the residue of an acid blocking group, which process comprises treating a compound having the formula



XX

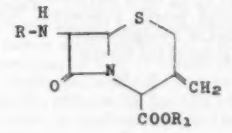
in which R^6 is H or acetoxy, CO_2R^9 is a carboxyl group blocked to convert it into a group not reacting with the acid halide used for forming the imino-halide, and acyl is the residue of a carboxylic acid; with an acid halide to form an imino-halide, converting the imino-halide into an imino-ether by means of treating the imino-halide with an alcohol and splitting the imino-ether double bond with a compound containing a hydroxy group; the improvement of which comprises using diisopropylamine or dicyclohexylamine as the acid scavenger in the imino-halide forming step.

3,932,393
3-METHYLENECEPHALOSPORINS AND PROCESS FOR PRODUCTION THEREOF

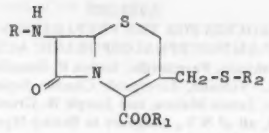
Robert R. Chauvette, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 25, 1971, Ser. No. 118,941
Int. Cl.² C07D 501/18
U.S. Cl. 260—243 C 19 Claims

1. The process for preparing a compound of the formula



which comprises reducing a 3-substituted methyl-Δ^3-cephem compound of the formula



in an inert solvent (1) in the presence of hydrogen and a nickel or cobalt hydrogenation catalyst at a temperature between 25° and 45°C. or (2) in the presence of dimethylformamide at a temperature between 0° and 60°C. with a reducing agent selected from the group consisting of

a. aluminum amalgam,

b. zinc in the presence of an acid,

c. zinc amalgam in the presence of an acid,

d. zinc-copper couple in the presence of an acid, and

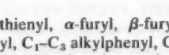
e. chromium II cations in the presence of an acid,

wherein b-e, said acid is a carboxylic acid having a pK'a of pK'a 4.0 or lower or a dilute mineral acid at a concentration between 0.5 and 5 percent;

wherein in the foregoing formulae

R_1 is hydrogen, C_1–C_4 alkyl, benzyl, p-methoxybenzyl, benzhydryl, 4-methoxybenzhydryl and phenacyl; or a pharmaceutically acceptable cation;

R is hydrogen, C_1–C_8 alkanoyl, C_5–C_{10} cycloalkanoyl, C_3–C_8 hydroxyalkanoyl, C_3–C_8 alkanoyl substituted by carboxy and amino or protected amino, benzoyl, C_1–C_3 alkylbenzoyl, C_1–C_3 alkoxybenzoyl, halobenzoyl, aminobenzoyl, or an acyl group represented by the formula



wherein

P is α-thienyl, β-thienyl, α-furyl, β-furyl, benzothienyl, benzofuryl, phenyl, C_1–C_3 alkylphenyl, C_1–C_3 alkoxyphenyl, hydroxyphenyl, halophenyl or aminophenyl,

Z is oxygen or sulfur,

n is 0 or 1,

m is an integer of from 0 to 3,

a is hydrogen or C_1–C_3 alkyl,

b is hydrogen, C_1–C_3 alkyl, hydroxy, or amino,

with the limitation that when

n is 1, P is phenyl, C_1–C_3 alkylphenyl, C_1–C_3 alkoxyphenyl, hydroxyphenyl, halophenyl or aminophenyl and b is hydrogen or C_1–C_3 alkyl.

R_2 is C_2–C_4 alkanoyl, C_2–C_4 haloalkanoyl, benzoyl, C_1–C_3 alkylbenzoyl, C_1–C_3 alkoxybenzoyl, halobenzoyl, or aminobenzoyl, C_1–C_4 alkyl, C_1–C_{12} alkoxythionocarbonyl, an amidino group of the formula

wherein

R_4, R_5, R_6 and R_7 are the same or different, and represent hydrogen, C_1–C_6 alkyl, C_3–C_7 cycloalkyl, phenyl, phenyl substituted by C_1–C_4 lower alkyl, halogen, amino or hydroxy, naphthyl, benzyl, 2-phenethyl, 3-phenylpropyl, naphthylmethyl or 2-naphthylethyl,

a thiocarbamoyl group of the formula

wherein

R_8 and R_9 when taken separately are the same or different and are hydrogen, C_1 –C_6 alkyl, phenyl, C_1–C_3 alkylphenyl, C_1–C_3 alkoxyphenyl, halophenyl, hydroxyphenyl or aminophenyl, and R_8 and R_9 when taken together form a 4 or 5 membered alkylene, azaalkylene or oxaalkylene bridge;

a heteroaryl group selected from the group consisting of pyridyl, 2-pyrimidyl, 2-imidazolyl, 2-thiazolyl, 2-benzthiazolyl, 2-benzoxazolyl, 2-tetrazolyl, 1-methyl-2-tetrazolyl, thiadiazolyl and 2-methyl-5-thiadiazolyl; or

a group of the formula $-SO_3-M^+$

wherein

M^+ is an alkali or alkaline earth metal cation; such that when R_2 is amidino or substituted amidino group, R_1 is hydrogen or when R_2 is $—SO_3—M^+$, R_1 is M^+.

3,932,394

ANTIVIRAL COMPLEX

Douglas Broadbent; Harold George Hemming, and Barrie Hesp, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

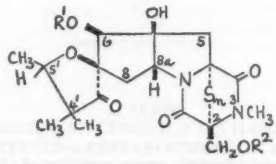
Filed Aug. 28, 1973, Ser. No. 392,354

Claims priority, application United Kingdom, Sept. 14, 1972, 42694/72

Int. Cl.² C07D *285/00*

U.S. Cl. 260—243 R **2 Claims**

1. A compound of the formula:-



I

wherein n is 2 and either R^1 is acetyl and R^2 is hydrogen or R^1 and R^2 are both hydrogen or both acetyl.

3,932,395

TRICYCLIC IMIDAZOLE DERIVATIVES

Kalman Hideg; Olga Hankovszky, both of Pecs; Eva Palosi; Gyorgy Hajos, both of Budapest, and Laszlo Szporny, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Hungary

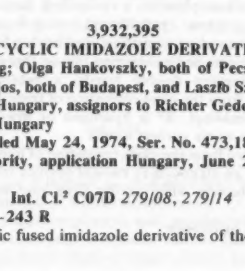
Filed May 24, 1974, Ser. No. 473,184

Claims priority, application Hungary, June 20, 1973, OE 509

Int. Cl.² C07D *279/08, 279/14*

U.S. Cl. 260—243 R **4 Claims**

1. A tricyclic fused imidazole derivative of the formula (I),

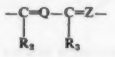


(I)

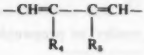
wherein

R_1 stands for hydrogen or hydroxy.

n is equal to zero or one,
m is equal to zero or one, $m+n=1$,
A stands for a group of the formula (II),



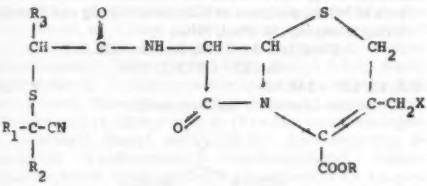
wherein
R_2 represents hydrogen or hydroxy,
R_3 represents hydrogen or amino, and
Q and Z each stand for nitrogen or a =CH— group, or
A stands for a group of the formula (III),



wherein R_4 and R_5 each represent hydrogen, methyl, chlorine or nitro, or an acid additional salt thereof.

3,932,396
CYANOMETHYLTHIOACETYLCEPHALOSPORINS
Hermann Breuer, and Uwe Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.
Division of Ser. No. 278,168, Aug. 4, 1972, Pat. No. 3,855,212. This application Oct. 10, 1974, Ser. No. 513,676
Int. Cl.² C07D *501/36, 501/26*
U.S. Cl. 260—243 C **8 Claims**

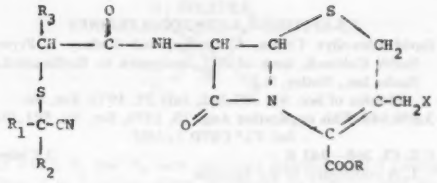
1. A compound of the formula



wherein R is hydrogen or a salt forming ion of the group consisting of aluminum, alkali metal, alkaline earth metal, mono-lower alkylamine; dilower alkylamine, tri-lower alkylamine, dibenzylamine, N,N'-dibenzyl- ethylenediamine, procaine or lower alkylpiperidine; R_1 and R_2 each is hydrogen, lower alkyl, lower alkenyl, phenyl, hydroxyphenyl, chlorophenyl, benzyl, phenethyl or R_1 and R_2 together complete the cyclopentyl or cyclohexyl group; R_3 is C_4-C_7-cyclo-lower alkyl, C_4-C_7-cyclo-lower alkenyl or C_4-C_7-cyclo-lower alkadienyl; and X is hydrogen, lower alkanoyloxy, lower alkoxy or lower alkylthio; said lower alkyl, lower alkenyl, lower alkanoyloxy and lower alkoxy groups having up to seven carbon atoms.

3,932,397
CYANOMETHYLTHIOACETYLCEPHALOSPORINS
Hermann Breuer, and Uwe Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.
Division of Ser. No. 278,168, Aug. 4, 1972, Pat. No. 3,855,212. This application Oct. 10, 1974, Ser. No. 513,677
Int. Cl.² C07D *501/28, 501/36*
U.S. Cl. 260—243 C **5 Claims**

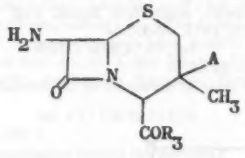
1. A compound of the formula



wherein R is hydrogen or a salt forming ion of the group consisting of aluminum, alkali metal, alkaline earth metal, mono-lower alkylamine, di-lower alkylamine, tri-lower alkylamine, dibenzylamine, N,N-dibenzyl diamine, procaine or lower alkylpiperidine; R_1 and R_2 each is hydrogen, lower alkyl, lower alkenyl, phenyl, hydroxyphenyl, chlorophenyl, benzyl, phenethyl or R_1 and R_2 together complete the cyclopentyl or cyclohexyl group; R_3 is hydrogen, lower alkyl or lower alkenyl; and X is lower alkoxy or lower alkylthio; said lower alkyl, lower alkenyl and lower alkoxy groups having up to seven carbon atoms.

3,932,398
3-HALO-CEPHAM DERIVATIVES
Abraham Nudelman, Bala Cynwyd, and Ronald J. McCaully, Malvern, both of Pa., assignors to American Home Products Corporation, New York, N.Y.
Filed Apr. 19, 1973, Ser. No. 352,850
Int. Cl.² C07D *501/18, 501/10*
U.S. Cl. 260—243 C **2 Claims**

1. A compound of the formula:



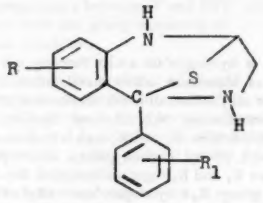
in which
R^3 is a member selected from the group consisting of hydroxy, lower alkoxy, 2,2,2-trichloroethoxy, aryloxy of 6 to 10 carbon atoms, aralkoxy of 7 to 12 carbon atoms, alkoxyaralkoxy of 9 to 14 carbon atoms, mono- or dilower alkylamino, arylamino of 6 to 10 carbon atoms, saccarimido, phthalimido, and OM where M is an alkali metal cation, an alkaline earth metal cation or the ammonium cation;
A is a member selected from the group consisting of —Cl, —Br and —I; and
the pharmaceutically acceptable acid addition salts thereof.

3,932,399
2,5-EPITHIO-1,4-BENZODIAZEPINES

David Llewellyn Coffen, Glenridge, and Rodney I. Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 383,362, July 27, 1973, Pat. No. 3,850,948. This application Aug. 28, 1974, Ser. No. 501,303
Int. Cl.² C07D *513/08*
U.S. Cl. 260—243 R 3 Claims

1. A compound of the formula



wherein R is selected from the group consisting of hydrogen, halogen, lower alkyl, trifluoromethyl, nitro, cyano, lower alkoxy and lower alkylthio; R_1 signifies hydrogen or halogen

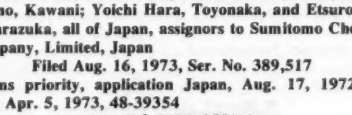
and the pharmaceutically acceptable acid addition salts thereof.

3,932,400
THIAZOLE DERIVATIVES

Toshihiko Hibino, Takarazuka; Yoshio Suzuki, Itami; Shigeru Okano, Kawani; Yoichi Hara, Toyonaka, and Etsuro Sato, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

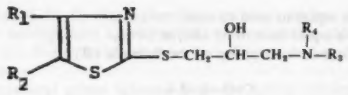
Filed Aug. 16, 1973, Ser. No. 389,517
Claims priority, application Japan, Aug. 17, 1972, 47-82574; Apr. 5, 1973, 48-39354
Int. Cl.² C07D *277/36*
U.S. Cl. 260—247.1 M 10 Claims

1. A novel thiazole derivative of the formula:



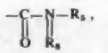
wherein R_1 is hydrogen, C_1 - C_4 alkyl, C_4 - C_6 cycloalkyl, naphthyl, phenyl, phenyl substituted by a member selected from the group consisting of C_1 - C_4 alkyl, C_1 - C_4 alkoxy, hydroxyl, C_3 - C_5 alkenyl, C_3 C_4 alkenyloxy, iodo, chloro, bromo, fluoro, cyano, amino, nitro, phenoxy, naphthoxy, acetamido, propionamido and benzamido or naphthyl substituted by a member selected from the group consisting of C_1 - C_4 alkyl, C_1 - C_4 alkoxy, hydroxy, fluoro, iodo, chloro or bromo, cyano, amino, nitro, acetamido, propionamido and benzamido, and R_2 is hydrogen and R_3 and R_4 are each hydrogen or C_1 - C_4 alkyl.

10. A thiazole derivative of the formula



wherein R_1 is thienyl or substituted thienyl having one or more groups selected from the group consisting of C_1 – C_4 alkyl, phenyl, bromo, iodo, nitro,

wherein Y is C_1 – C_4 alkoxy, methyl or propenyloxy or



wherein R_5 and R_6 are each hydrogen, C_1 – C_4 alkyl, amino or cyclohexyl and when taken together with adjacent nitrogen are morpholinyl, piperidyl or pyrrolidinyl, R_2 is hydrogen and R_3 and R_4 are each are hydrogen or lower alkyl.

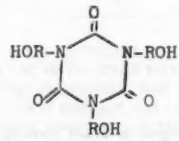
3,932,401
MIXED ACRYLIC ACID/METHACRYLIC ACID ESTERS OF TRIS (HYDROXYALKYL) ISOCYANURATES

Carl John Berg, St. Paul, and Edward John Deviny, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 31, 1974, Ser. No. 438,207
Int. Cl.² C07D *251/34*
U.S. Cl. 260—248 NS 2 Claims

1. The non-crystalline reaction product of

1.



where R is alkylene of one to four carbon atoms, with

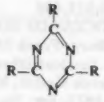
2. a mixture comprising acrylic acid and methacrylic acid; the weight-ratio of acrylic acid to methacrylic acid in the reaction mixture being between about 80:20 and 20:80, and sufficient acrylic acid and methacrylic acid being included in the reaction mixture to esterify at least 80 percent of the hydroxyl groups on the isocyanurate ring.

3,932,402
PREPARATION OF SYM-TRIAZINES BY TRIMERIZATION OF NITRILES IN TRIFLUOROMETHANESULFONIC ACID

John R. Norell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 24, 1974, Ser. No. 482,257
Int. Cl.² C07D *251/24*
U.S. Cl. 260—248 CS 16 Claims

1. A process for the preparation of a substituted triazine of the formula



wherein R is a radical selected from the group consisting of alkyl, aryl and substituted aryl having from 2 to 9 carbon atoms per radical group, wherein said alkyl group contains an alpha-hydrogen, and wherein said substituted aryl is substituted with alkyl, halogen or alkoxy which comprises reacting a nitrile having the formula R-CN, wherein R is as defined above, under reaction conditions in the presence of trifluoromethanesulfonic acid.

3,932,403

PHOSPHORUS ACID AMIDES

Stanley Ashton; Vijay Ratna Sharma, and John Anthony Taylor, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

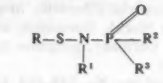
Filed July 20, 1973, Ser. No. 381,223

Claims priority, application United Kingdom, July 24, 1972, 34478/72

Int. Cl.² C07F 9/22, 9/24, 9/26

U.S. Cl. 260—248 R **4 Claims**

1. An amide of the formula



wherein R is alkyl of up to 18 carbon atoms, 2-formylprop-2-yl, alkenyl of up to 18 carbon atoms, cyclopentyl, cyclohexyl, phenyl, tolyl, butyl phenyl, naphthyl, β-methyoxyethyl, β-cyanoethyl, 4-chlorophenyl, 4-methoxyphenyl, 4-dimethylaminophenyl, 2-nitrophenyl, 4-nitrophenyl, 2,3,4,5,6-pentachlorophenyl, 2-methoxycarbonylphenyl or 4-phenylsulphonylphenyl; R^1 is hydrogen, alkyl of up to 18 carbon atoms, 2-formylprop2-yl, alkenyl of up to 18 carbon atoms, cyclopentyl, cyclohexyl, phenyl, tolyl, naphthyl, β-methoxyethyl, β-cyanoethyl, 4-chlorophenyl, 4-methoxyphenyl, 4-dimethylaminophenyl, 2-nitrophenyl, 4-nitrophenyl, 2,3,4,5,6-pentachlorophenyl, 2-methoxycarbonylphenyl, 4-phenylsulphonylphenyl, p-toluene sulphonyl, acetyl or N=CH-R where R has the meaning stated above; R^2 and R^3 are each a group R-S-NR^1 where each of R and R^1 have the meaning stated above, hydrogen, halogen, a value as recited for R, 2-benzothiazolylthio, 2-benzoxazolylthio, 2-benzimidazolylthio, 2-pyrimidinylthio or 2-triazinylthio groups, amino, ethylamino, diethylamino, dimethylamino, phenylamino, methylphenylamino or ethylphenylamino; or R^2 and R^3 together with the phosphorus atom joining them form 2-oxo-1,3,2-diazaphospholane, 2-oxo-4,5-benzo-1,3,2-diazaphospholane, 2-oxo-1,3,2-oxazaphospholane, 2-oxo-4,5-benzo-1,3,2-oxazaphospholane, 2-oxo-4,5-benzo-1,3-thiazaphospholane, or 2-oxo-2,3-dithiaphospholane.

3,932,404

PROCESS FOR MAKING PYRAZINES FROM 2-AZA-1,3-UTADIENES

Jean-Pierre Louis Fleury, Mulhouse, France, assignor to Pechiney Ugine Kuhlmann, Paris, France

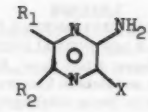
Filed Mar. 21, 1973, Ser. No. 343,590

Claims priority, application France, Jan. 20, 1972, 72.01854

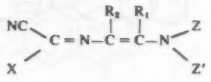
Int. Cl.² C07D 241/28

U.S. Cl. 260—250 BC **15 Claims**

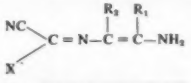
1. A process for the preparation of an aminopyrazine represented by the formula:



in which R_1 and R_2 each represent hydrogen, alkyl having from 1 to 5 carbon atoms, or phenyl, or together with the carbon atoms of the pyrazine ring to which they are linked form a cycloalkene having from 5 to 7 carbon atoms in the ring, and X represents cyano, carboxy, carbonamide or alkoxycarbonyl having from 1 to 4 carbon atoms in the alkoxy chain which consists in contacting a 1-cyano-4-N(disubstituted) amino-2-azo-1,3-butadiene of the formula:



wherein Z and Z′ together with the nitrogen atom form a morpholino, piperidino or pyrrolidino group, which may be unsubstituted or substituted by one or several lower alkyl groups, with ammonia in the presence of a solvent and reacting the 1-cyano-4-amino-2-aza-1,3-butadiene of the formula:



thus obtained with a basic agent selected from the group consisting of alcoholoates, ammonia, amines and quaternary ammonium hydroxides.

3,932,405

PHENYLPYRIDAZINES

Rupert Schonbeck, Leonding near Linz; Engelbert Kloimstein, Eferding; Hubert Mayr, Leonding near Linz; Alfred Diskus, and Engelbert Auer, both of Linz, all of Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

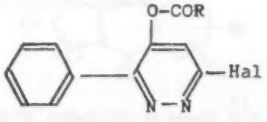
Filed Nov. 14, 1973, Ser. No. 415,555

Claims priority, application Germany, Nov. 16, 1972, 2256172

Int. Cl.² C07D 237/10

U.S. Cl. 260—250 A **30 Claims**

1. A phenylpyridazine having the formula



in which Hal is an atom selected from the group consisting of chlorine and bromine and R is selected from the group consisting of straight-chain or branched alkyl having 2 to 20 carbon atoms, when Hal is chlorine, and, when Hal is bromine, having 1 to 20 carbon atoms, and consisting of the group OR′, wherein R′ is selected from the group consisting of straight-chain or branched alkyl having 1 to 18 carbon atoms.

3,932,406
2-TRIFLUOROMETHYLIMINO-1,3-DITHIOLO [4,5-B]-QUINOXALINES

Gerhard Buttner, Cologne; Klaus Sasse, Schildgen; Ingeborg Hammann, Cologne, and Helmut Kaspers, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

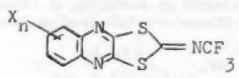
Filed Apr. 23, 1974, Ser. No. 463,642

Claims priority, application Germany, May 4, 1973, 2322434

Int. Cl.² C07D *495/04*

U.S. Cl. 260—250 Q **7 Claims**

1. A 2-trifluoromethylimino-1,3-dithiolo -quinoxaline of the formula



in which

each X is selected independently from the group of lower alkyl of up to 4 carbon atoms, lower alkoxy, trihalogenomethyl, trihalogenomethoxy, halogen and nitro, and

n is 0, 1 or 2.

3,932,407
OPTIONALLY SUBSTITUTED 1,2,3,5-TETRAHYDROIMIDEZO(2,1-B)-QUINAZOLIN-2-NES AND 6(H)-1,2,3,4-TETRAHYDROPYIMIDO(2,1-B)QUINAZOLIN-2-ONES

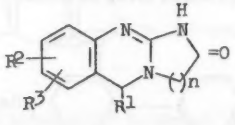
Warren Neil Beverung, Jr., Minoa, and Anthony Partyka, Liverpool, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 416,891, Nov. 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 396,638, Sept. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 291,450, Sept. 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 223,723, Feb. 4, 1972, abandoned. This application Nov. 6, 1974, Ser. No. 521,306

Int. Cl.² C07D *239/84*

U.S. Cl. 260—256.4 F **19 Claims**

1. The compound having the formula



I

in which R^1 is H, phenyl or (lower)alkyl, R^2 and R^3 when different are hydrogen, chloro, bromo, fluoro, CF_3, SO_3H, hydroxy, (lower)alkyl or (lower) alkoxy, nitro, amino or phenyl, R^2 and R^3 when alike are hydrogen, bromo, chloro, fluoro, hydroxy, (lower)alkyl of 1 to 3 carbon atoms or (lower)alkoxy of 1 to 3 carbon atoms, or when taken together R^2 and R^3 are methylenedioxy or the moiety -CH=CH-CH=CH-, and n is an integer of 1 or 2; or a pharmaceutically acceptable acid addition salt thereof.

3,932,408
PYRIMIDINES AND PROCESS OF MAKING THE SAME

Herbert Eck, Burghausen Burg; Frank Muller, Siegertsbrunn, and Sven E. Wihrheim, Furstenfeldbruck, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

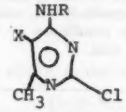
Filed Dec. 19, 1973, Ser. No. 426,419

Claims priority, application Germany, Dec. 22, 1972, 2263052

Int. Cl.² C07D *239/30*

U.S. Cl. 260—256.4 N **1 Claim**

1. A compound of the formula



wherein X is a member of the group consisting of H and Br, and R is a member of the group consisting of straight-chain and branched-chain alkyl and cycloalkyl having from 5 to 8 C-atoms.

3,932,409
URETHANE DERIVATIVES OF 2-PHENYL-4(3H)-QUINAZOLONES

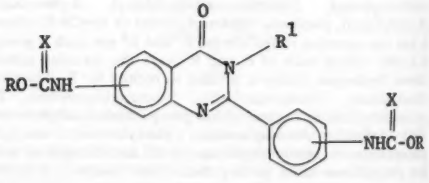
Hans-Egon Kunzel; Gerhard Dieter Wolf, both of Dormagen; Robert Bierling, Wuppertal-Elberfeld; Siegfried Petersen, Leverkusen; Gunther Nischk, Dormagen, and Dieter Steinhoff, Bochum, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 188,454, Oct. 12, 1971, abandoned. This application June 7, 1974, Ser. No. 477,442

Int. Cl.² C07D *239/00*

U.S. Cl. 260—256.4 Q **23 Claims**

1. A compound of the formula:



wherein

X is oxygen or sulfur;

R^1 is alkyl of 1 to 6 carbon atoms, unsubstituted phenyl or phenyl substituted with from one to three members selected from the group consisting of chloro, fluoro, bromo, alkyl of one to six carbon atoms and alkoxy of one to six carbon atoms; and

R is cycloalkyl of five or six carbon atoms, alkylcycloalkyl wherein alkyl is of one to six carbon atoms and cycloalkyl is of five or six carbon atoms, unsubstituted alkyl of one to 20 carbon atoms, or alkyl of one to six carbon atoms substituted by hydroxy, alkoxy of one to six carbon

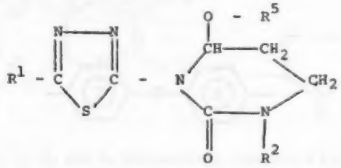
atoms, phenyl, phenoxy or cycloalkyl of five or six carbon atoms.

3,932,410
1-THIADIAZOLYL-6-ALKOXYTETRAHYDROPYRIMIDINONES

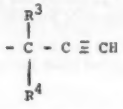
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Nov. 1, 1974, Ser. No. 519,896
Int. Cl.² C07D *239/00*
U.S. Cl. 260—256.5 R **8 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower chloroalkyl, lower bromoalkyl, trifluoromethyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl; R^2 is selected from the group consisting of lower alkyl, lower alkenyl, lower chloroalkyl, lower bromoalkyl, and



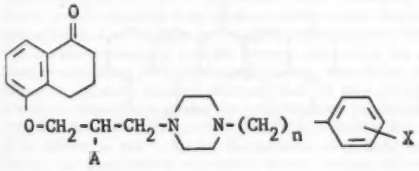
wherein R^3 and R^4 are each selected from the group consisting of hydrogen and lower alkyl; and R^5 is lower alkyl.

3,932,411
3,4-DIHYDRO-2H-NAPHTHALENE-1-ONE-5-OXYPROPYL-PIPERAZINE COMPOUNDS

Franz Braun, Rimbach; Max Thiel, Mannheim; Kurt Stach, Mannheim-Waldhof; Egon Roesch, and Androniki Roesch, both of Mannheim am Oberen Luisenpark, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Filed June 25, 1974, Ser. No. 482,957
Claims priority, application Germany, July 12, 1973, 2335432
Int. Cl.² C07D *241/04*
U.S. Cl. 260—268 BC **14 Claims**

1. 3,4-dihydro-2H-naphthalene-1-one-5-oxypropyl-piperazine compound of the formula



(1)

wherein

A is hydrogen or hydroxyl;

X is hydrogen, halogen, alkyl of up to 3 carbon atoms or alkoxy of up to 3 carbon atoms; and

n is 0, 1 or 2;

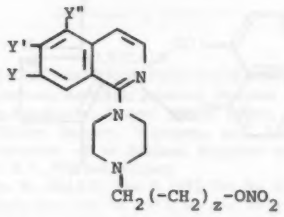
and the pharmacologically compatible salts thereof.

3,932,412
1-(4-HYDROXYALKYLPIPERAZINO)-ISOQUINOLINE NITRATES

William R. J. Simpson, Hanover, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 95,989, Dec. 7, 1970, Pat. No. 3,778,440. This application Aug. 6, 1973, Ser. No. 386,084
Int. Cl.² C07D *295/12*
U.S. Cl. 260—268 BQ **6 Claims**

1. A compound of the formula:



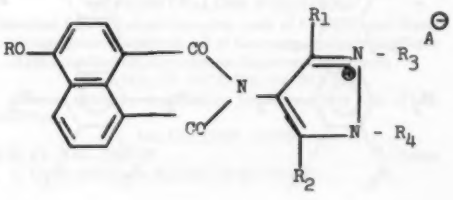
wherein z is 1 to 4 and each of Y, Y′ and Y″ is hydrogen, alkoxy of 1 to 3 carbon atoms or alkyl of 1 to 3 carbon atoms, or Y and Y′ together form methylenedioxy; provided that no more than 2 of Y, Y′ and Y″ are lower alkyl; or a pharmaceutically acceptable non-toxic acid addition salt thereof.

3,932,413
PROCESS FOR THE PREPARATION OF 4′-ALKOXY-4-NAPHTHALIMIDO-PYRAZOLIUM COMPOUNDS AND INTERMEDIATES THEREFOR

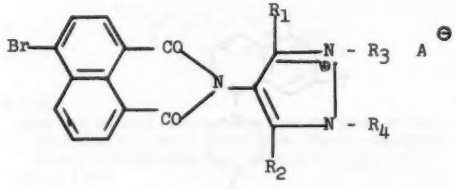
Annick Marthe Suzanne Simone Domergue, Eaubonne; Robert Frederic Michel Sureau, Enghien-le-Bains; Jean Ernest Etienne Leboulenger, Taverny, and Jean Marie Alfred Houssin, Enghien-le-Bains, all of France, assignors to Products Chimiques Ugine Kuhlmann, Paris, France

Filed May 21, 1973, Ser. No. 362,555
Claims priority, application France, May 24, 1972, 72.18445
Int. Cl.² C07D *217/24, 231/40*
U.S. Cl. 260—270 H **5 Claims**

1. A process for the preparation of an optical brightening agent falling within the formula:



in which R represents an alkyl group of 1 to 4 carbon atoms, R_1 and R_2 each represent a hydrogen atom, an alkyl group of 1 to 4 carbon atoms or a phenyl group either unsubstituted or substituted by one or two alkyl groups of 1 to 4 carbon atoms, with the proviso that if either R_1 or R_2 are bis (t-butyl) phenyl, then the t-butyl groups are not in adjacent positions on the phenyl ring, R_3 and R_4 each represent an alkyl group of 1 to 4 carbon atoms and A^- represents the monovalent anion chloride, bromide, chlorozincate or methylsulfate which consists of reacting a compound of the formula:



in which R_1, R_2, R_4, and A^- have the meanings given above, with an alcoholate of the formula RO-Me in which R represents an alkyl group of 1 to 4 carbon atoms and Me is an alkali metal.

3,932,414
ACRIDONE COMPOUNDS

Rodolf Altiparmakian, Binningen, and Hans Bohler, Rheinfelden, AG, both of Switzerland, assignors to Sandoz Ltd., (Sandoz AG), Basel, Switzerland

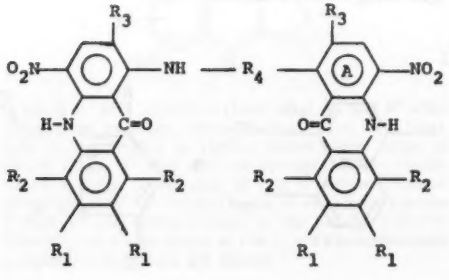
Filed Apr. 1, 1974, Ser. No. 456,629

Claims priority, application Switzerland, Apr. 6, 1973, 5028/73

Int. Cl.² C09B *15/00*; C07D *219/08*

U.S. Cl. 260—279 R **16 Claims**

1. A compound of formula I,



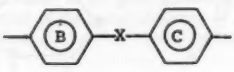
wherein the

R_1's are independently hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy, chlorine or bromine,

the R_2's are independently hydrogen, methyl, chlorine or bromine,

the R_3's are independently hydrogen, chlorine or bromine, and

R_4 is a direct bond or a group $—R_5—NH—$, in which the imino group is bound to nucleus A, and R_5 is a 1,3- or 1,4-phenylene radical, unsubstituted or substituted by 1 or 2 substituents selected from chlorine, bromine, methyl, C_{1-4} alkoxy and nitro; or a radical



in which X is a direct bond, —O—, $—SO_2—$, —N=N—, or —NHCO— and each of rings B and C is optionally substituted by 1 or 2 substituents selected from chlorine, bromine, methyl, C_{1-4} alkoxy and nitro,

or a mixture of compounds of formula I.

3,932,415
PYRYLIUM DYES HAVING A FUSED RIGIDIZED NITROGEN-CONTAINING RING

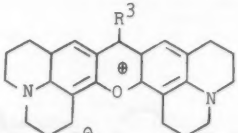
George A. Reynolds, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 244,916, April 17, 1972, Pat. No. 3,822,270, which is a continuation-in-part of Ser. No. 170,349, Aug. 9, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 389,936

Int. Cl.² C07D *215/58*

U.S. Cl. 260—286 R **4 Claims**

1. A compound having the formula



wherein

R^3 represents a member selected from the group consisting of hydrogen, alkyl having 1 to 10 carbon atoms, phenyl, carboxyphenyl and ethoxycarbonyl phenyl

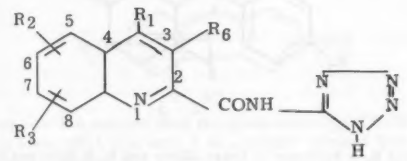
and X is an anion selected from the group consisting of halide, perchlorate and fluoroborate.

3,932,416
N-TETRAZOLYL QUINALDAMIDES

David Edmund Bays; Mervyn Evan Peel; David Martin Waters, all of London, England, and Gwynn Pennant Ellis, Cardiff, Wales, assignors to Allen & Hanburys Limited, London, England

Filed June 21, 1973, Ser. No. 372,027
Claims priority, application United Kingdom, July 3, 1972, 30990/72
Int. Cl.² C07D 215/16
U.S. Cl. 260—287 F 35 Claims

1. A compound of the formula:



in which R_1, R_2 and R_3 independently represent a hydrogen atom, alkyl, nitro, a halogen atom or $—NR_4R_5$ or $—OR_4$; in which R_4 and R_5 independently represent a hydrogen atom, alkenyl, cycloalkyl, alkyl, or alkyl substituted by alkoxy, hydroxy, amino, alkylamino, dialkylamino or phenyl and R_6 represents a hydrogen atom or a pharmaceutically acceptable ester thereof with a simple aliphatic acid; or a pharmaceutically acceptable salt thereof, any alkyl moiety being of 1 to 6 carbon atoms, any alkenyl moiety being of 2 to 6 carbon atoms, any cycloalkyl moiety being of 5 or 6 carbon atoms, R_2 and R_3, when both are vicinal and other than hydrogen, said substituents are methyl and there being present no more than one nitro substituent.

3,932,417
DIMERIC INDOLE ALKALOID PURIFICATION PROCESS

William E. Jones, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 24, 1973, Ser. No. 409,225
Int. Cl.² C07D 215/00
U.S. Cl. 260—287 R 2 Claims

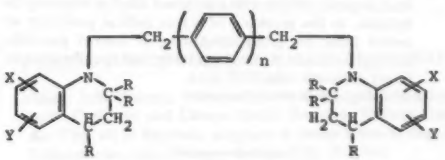
1. A process for the purification of the dimeric vinca alkaloids — vincristine, des-N-methylvinblastine and vinblastine — which comprises the steps of extracting a plant source of said alkaloids with aqueous acid at a pH ≈ 3, extracting the acidic solution thus obtained with a water-immiscible organic solvent, discarding the extract, adjusting the pH of the acidic solution to pH ≈ 6 by the addition of alkali metal hydroxide or ammonium hydroxide, extracting the pH ≈ 6 layer with a water-immiscible organic solvent, discarding the aqueous layer, separating and evaporating the solvent from the organic extract to obtain residual alkaloids, further purifying the residual alkaloids either (a) by subjecting them to gel exclusion chromatography in a pH = 7 aqueous buffer, extracting the dimeric indole alkaloids from aqueous buffer eluate fractions determined to contain them by standard analytical procedures with a water-immiscible organic solvent, separating the extracts, evaporating the extracting solvent therefrom, dissolving the partially purified residual alkaloids thus obtained in a lower alkanol, separating by centrifugation precipitated crystalline leurosine thus formed therefrom, adjusting the pH of the filtrate to pH ≈ 4.2 by the addition of sulfuric acid, filtering the precipitated crystalline dimeric indole alkaloid sulfate salts thus formed, treating an aqueous solution of the isolated sulfates with alkali, thus forming the corresponding free bases, chromatographing the free bases over alumina at high pressure thereby separating vincristine, des-N-methylvinblastine and vinblastine from other alkaloids and from each other, collecting eluate fractions each consisting essentially of a separated alkaloid and crystallizing vincristine, des-N-methylvinblastine and vinblastine from said collected eluate fractions in purified form or (b) by dissolving them directly in a lower alkanol, separating precipitated crystalline leurosine thus formed therefrom, adjusting the pH of the filtrate to pH ≈ 4.2 by the addition of sulfuric acid, filtering the precipitated crystalline dimeric indole alkaloid sulfate salts thus formed, treating an aqueous solution of the isolated sulfates with alkali, thus forming the corresponding free bases, chromatographing the free bases over alumina at high pressure thereby separating vincristine, des-N-mehtylvinblastine and vinblastine from other alkaloids and from each other, collecting eluate fractions each consisting essentially of a separated alkaloid and crystallizing vincristine, des-N-methylvinblastine and vinblastine from said collected eluate fractions in purified form.

3,932,418
ELECTROPHOTOGRAPHIC MATERIAL

Wilhelmus Janssens, Aarschot; Johannes Josephus Vanheertum, Halle-Zandhoven; Robert Joseph Pollett, Vremde; Hendrik Hubert Sneyers, Wijnegem, and Jozef Aime Dierckx, Mechelen, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Division of Ser. No. 304,939, Nov. 9, 1972, Pat. No. 3,798,031.
This application Oct. 18, 1973, Ser. No. 407,650
Claims priority, application United Kingdom, Nov. 10, 1971, 52287/71
Int. Cl.² C07D 215/12
U.S. Cl. 260—288 CE 2 Claims

1. A chemical compound having photoconductive properties and corresponding to the formula:



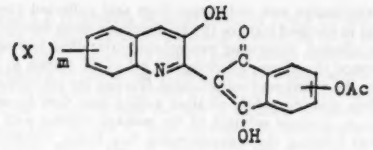
where
n is 1,
X and Y are hydrogen,
R is hydrogen or methyl

3,932,419
QUINOPHTHALONE DYESTUFFS

Manfred Groll; Volker Hederich, both of Cologne, and Hans-Samuel Bien, Burscheid, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed May 25, 1973, Ser. No. 363,990
Claims priority, application Germany, May 27, 1972, 2225960
Int. Cl.² C09B 215/00
U.S. Cl. 260—289 QP 3 Claims

1. Quinophthalone dyestuff of the formula



in which

Ac is phenylsulphonyl or phenylsulphonyl mono-or di-substituted by halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, nitro, or methylmercapto, provided that in the case of disubstituted nitro or disubstituted tertiary-butyl, the substituents will be on nonadjacent carbon atoms;

X is chlorine, bromine, or C_1-C_4-alkyl; and

m is 0, 1, or 2;

provided that when X is tertiary-butyl and *m* is 2 the tertiary-butyls are on nonadjacent carbon atoms.

3,932,420

PROCESS FOR THE PREPARATION OF GLAZIOVINE

Julien Warnant, Neuilly-sur-Seine; Andre Farcilli, Rosny-sous-Bois; Italo Medici, Bondy, and Edmond Toromanoff, Paris, all of France, assignors to Roussel-UCLAF, Paris, France

Filed Feb. 21, 1974, Ser. No. 444,554

Claims priority, application France, Feb. 28, 1973, 73.07169

Int. Cl.² C07D *217/12*

U.S. Cl. 260—289 A **9 Claims**

1. A process for the preparation of glaziovine comprising the steps of:

a. treating N-methyl bromococlaurine of the formula: in an inert organic solvent with a tri-lower alkyl or triphenyl tin hydride, in the presence of a free radical promoter selected from the group consisting of lauroyl peroxide, benzoyl peroxide, stearoyl peroxide, and cyclohexanecarbonyl peroxide, and

b. isolating the desired glaziovine.

3,932,421

PROCESS FOR PRODUCING ALKYLPYRIDINES

Yoshizo Minato, Nishinomiya, and Shinichi Yasuda, Otsu, both of Japan, assignors to Koei Chemical Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 743,023, July 8, 1968, abandoned. This application July 2, 1971, Ser. No. 159,548

Claims priority, application Japan, July 13, 1967, 42-45158

Int. Cl.² C07C *213/10*

U.S. Cl. 260—290 P **12 Claims**

1. A method for producing 2-picoline and 4-picoline comprising

catalytically reacting acetaldehyde

with ammonia

in the gaseous phase

in the presence of a catalyst of at least one phosphate selected from the group consisting of cobalt magnesium phosphate, cobalt aluminum phosphate and lead aluminum phosphate which has been impregnated with 1% to 30% by weight of phosphoric acid or ammonium phosphate

in state of aqueous solution,

at a temperature of from 350° C. to 500° C. and

a space velocity of 200 Hr^{+1} to 2000 Hr^{+1}.

3,932,422

8-METHYLENE-3-AZABICYCLO[3.3.1]NON-6-EN-4-ONES

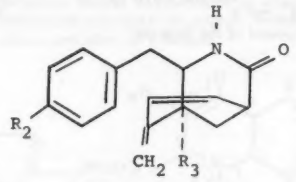
William F. Michne, Colonie, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed May 20, 1974, Ser. No. 471,571

Int. Cl.² C07D *221/22*

U.S. Cl. 260—293.54 **3 Claims**

1. A compound having the formula



where R_2 is hydrogen or lower-alkoxy and R_3 is hydrogen or lower-alkyl.

3,932,423

IMIDAZOLIDO(1,5-C)THIAZOLIDINE-3-SPIRO-4-PIPERIDINES

Katsuo Arimura, and Hideki Ao, both of Nakatsu, Japan, assignors to Yoshitomi Pharmaceutical Industries, Osaka, Japan

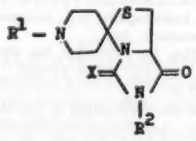
Filed May 28, 1974, Ser. No. 473,977

Claims priority, application Japan, May 28, 1973, 48-59991; July 4, 1973, 48-76009; Aug. 14, 1973, 48-91595; Aug. 14, 1973, 48-91596

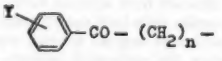
Int. Cl.² C07D *513/20*

U.S. Cl. 260—293.57 **10 Claims**

1. A compound of the formula:



wherein R^1 represents a member selected from the group consisting of a hydrogen atom, an alkyl group of from 1 to 4 carbon atoms, a benzyl group, a p-chlorobenzyl group, a 4,5-dimethoxybenzyl group, a 4,5,6-trimethoxybenzyl group, a phenethyl group, an acetyl group, a benzoyl group, a trimethoxybenzoyl group, a methoxycarbonyl group, an ethoxycarbonyl group, a 4,4-bis(p-fluorophenyl)butyl group and a group of the formula



(in which Y represents a member selected from the group consisting of H, F and CH_3O, and *n* represents an integer of 1, 2 or 3); R^2 represents a member selected from the group consisting of a hydrogen atom, an alkyl group of from 1 to 4 carbon atoms, an allyl group, a propargyl group, a cyclohexyl group, a phenyl group, a chlorophenyl group, a dichlorophenyl group, a tolyl group, a nitrophenyl group, a naphthyl group, a benzyl group, a phenethyl group and a cinnamyl group; and X represents a member selected from the group consisting of an oxygen atom and a sulphur atom, and pharmaceutically acceptable acid addition salts thereof.

3,932,424

BIS-BASIC ETHERS OF CARBAZOLE

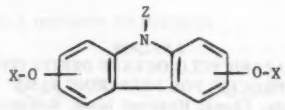
William L. Albrecht, and Robert W. Fleming, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Continuation of Ser. No. 46,462, June 15, 1970, abandoned. This application July 31, 1974, Ser. No. 493,271

Int. Cl.² C07D *209/88*

U.S. Cl. 260—293.61 7 Claims

1. A compound selected from a base of the formula

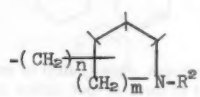


wherein Z is selected from the group consisting of hydrogen or lower alkyl; and each X is a member selected from the group consisting of

A. the group

wherein each A is a straight or branched alkylene chain having from 2 to 6 carbon atoms; R and R^1 are individually selected from the group consisting of hydrogen or lower alkyl having from 1 to 6 carbon atoms; or each set of R and R^1 taken together with the nitrogen atom to which they are attached is a saturated monocyclic heterocyclic group selected from pyrrolidino or piperidino; or

B. the group



wherein *n* is a whole integer from 0 to 2, *m* is 1 or 2, and R^2 is a member selected from the group consisting of hydrogen or lower alkyl having from 1 to 4 carbon atoms; or a pharmaceutically acceptable acid addition salt of said base.

3,932,425

BENZOSPIRAN DERIVATIVES

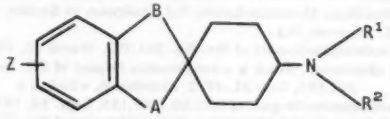
Daniel Lednicer, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 12, 1974, Ser. No. 460,449

Int. Cl.² C07D *295/02*

U.S. Cl. 260—293.62 10 Claims

1. A compound of the formula



wherein the sum of A and B carbon atoms is at least the integer 2; A is $-(CH_2)_n-$ wherein *n* is 1 through 5; B is absent or $-(CH_2)_n-$ wherein *n* is 1 through 3; R^1 is selected from the group consisting of hydrogen and lower alkyl of 1 through 3 carbon atoms; R^2 is selected from the group consisting of hydrogen, lower alkyl of 1 through 3 carbon atoms, R^1 and R^2 taken together with —N< is a saturated heterocyclic amino radical selected from the group consisting of pyrrolidino, piperidino, and hexamethylenimino; Z is selected from the group consisting of hydrogen, lower alkyl of 1 through 3 carbon atoms, lower alkoxy of 1 through 3 carbon atoms, nitro, amino, monoalkylamino of 1 through 3 carbon atoms, alkanoylamido of 1 through 4 carbon atoms, bromine, chlorine and fluorine; and a pharmacologically acceptable acid addition salt thereof.

3,932,426

3-[1-HYDROXY-2-(3- OR 4-HYDROXYPIPERIDINO)ETHYL]-5-PHENYLISOXAZOLE

Shiro Takahashi, Shita, Japan, assignor to Shionogi & Co., Ltd., Dosho, Japan

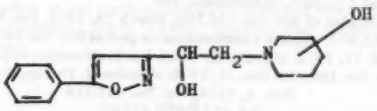
Filed Aug. 12, 1974, Ser. No. 496,858

Claims priority, application Japan, Aug. 23, 1973, 48-94563; Aug. 23, 1973, 48-94565

Int. Cl.² C07D *211/40*

U.S. Cl. 260—293.67 3 Claims

1. A member selected from the compounds of the formula:



wherein the hydroxy group on the piperidine ring is located at its 3 or 4 position.

3,932,427

PYRIDYL SUBSTITUTED AMINOALKYL-THIOUREAS AND UREAS

Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories, Inc., Welwyn Garden City, England

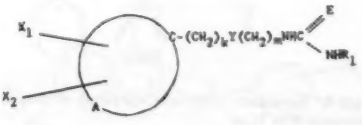
Continuation-in-part of Ser. No. 290,584, Sept. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,451, Feb. 29, 1972, abandoned. This application Mar. 13, 1974, Ser. No. 450,931

Claims priority, application United Kingdom, Mar. 9, 1971, 6352/71; July 22, 1971, 34334/71; Ireland, Feb. 3, 1972, 136/72

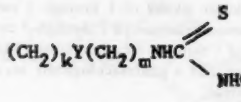
Int. Cl.² C07D *213/40*

U.S. Cl. 260—294.8 H 4 Claims

1. A compound of the formula:



wherein A is such that there is formed together with the carbon atom shown a pyridine ring; X_1 is hydrogen, lower alkyl, hydroxyl, trifluoromethyl, halogen, amino or



X_2 is hydrogen or when X_1 is lower alkyl, lower alkyl or halogen; k is 1 or 2 and m is 2 or 3, provided that the sum of k and m is 3 or 4; Y is NH; E is oxygen or sulphur; R_1 is hydrogen, lower alkyl or dimethylaminoethyl, or a pharmaceutically acceptable acid addition salt thereof.

3,932,428

1H-IMIDAZO(4,5,-B)-PYRIDINE DERIVATIVES

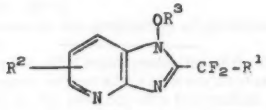
George O. P. Doherty, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 236,195, March 20, 1972, Pat. No. 3,818,022, which is a continuation-in-part of Ser. No. 181,638, Sept. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 100,410, Dec. 21, 1970, abandoned. This application Mar. 1, 1974, Ser. No. 447,116

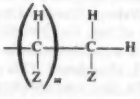
Int. Cl.² C07D 471/02

U.S. Cl. 260—295 F 5 Claims

1. The compounds of the formula

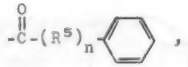


wherein R^1 represents hydrogen, chlorine, fluorine, difluoromethyl, perfluoroalkyl of C_1–C_6, or radical of the formula:



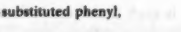
wherein each Z independently represents hydrogen or halogen and m represents 0 or 1; R^2 represents halogen, nitro, $-CF_3$, $-CF_2Cl$, $-CF_2H$, or loweralkylsulfonyl of C_1–C_4; and R^3 represents

1. alkanoyl of C_2–C_{16};
2. alkenoyl of C_3–C_{16};
3. radical of the formula



wherein R^5 represents methylene, ethylene, or vinylene, and n represents 0 or 1; or

4. radical of the formulae



and

wherein substituted phenyl is a phenyl radical bearing from 1–3 substituents, each of which is independently amino, nitro, chloro, methyl, or methoxy, and R^6 represents loweralkylene of C_1–C_4, both inclusive.

3,932,429

NOVEL AZABICYCLO OCTANE DERIVATIVE AND PROCESS FOR PREPARING SAME

Mikio Takeda, Urawa; Hirozumi Inoue, Kawaguichi; Goro Hayashi, Toyonaka, and Seiichi Nurimoto, Toyonaka, all of Japan, assignors to Tanabe Seiyaku Co., Ltd, Osaka, Japan

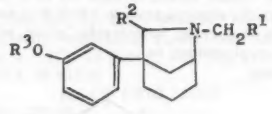
Filed July 10, 1974, Ser. No. 486,988

Claims priority, application Japan, July 14, 1973, 48-79570; July 14, 1973, 48-79571; July 14, 1973, 48-79572; July 23, 1973, 48-82871; July 23, 1973, 48-82872; Mar. 29, 1974, 49-36055; July 29, 1973, 48-36056; May 20, 1974, 49-56888; May 20, 1974, 49-56889; May 20, 1974, 49-59126; May 24, 1974, 49-59129

Int. Cl.² C07D 451/02, 401/06, 209/02, 209/32

U.S. Cl. 260—295.5 B 24 Claims

1. A compound of the formula:



wherein R^1 is hydrogen, phenyl, alkyl of one to five carbon atoms, cycloalkyl of three to four carbon atoms, or alkyl of one to five carbon atoms having a substituent selected from the group consisting of phenyl, benzoyl and 4-fluorobenzoyl, R^2 is hydrogen or alkyl of one to three carbon atoms, and R^3 is hydrogen, alkanoyl of two to six carbon atoms, benzoyl or nicotinoyl, or a pharmaceutically acceptable acid addition salt thereof.

3,932,430

SUBSTITUTED-INDENO, NAPHTHO AND CYCLOHEPTA PYRAZOLES

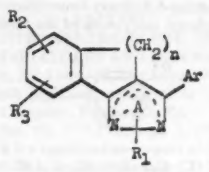
Dietmar A. Habeck, Heidelberg, Germany, and William J. Houlihan, Mountain Lakes, N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 341,392, March 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 302,595, Oct. 31, 1972, abandoned, which is a continuation-in-part of Ser. No. 289,155, Sept. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 231,387, March 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 259,859, June 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 274,868, July 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 188,938, Oct. 13, 1971, abandoned. This application Apr. 11, 1973, Ser. No. 350,140. The portion of the term of this patent subsequent to Oct. 15, 1991, has been disclaimed.

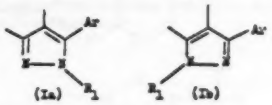
Int. Cl.² C07D 213/74

U.S. Cl. 260—296 T 9 Claims

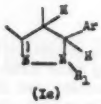
1. A compound of the formula



where ring A represents the structures



(Ia) (Ib)

or  ;

(Ic)

n is 2;

R_1 represents hydrogen or lower alkyl having 1 to 4 carbon atoms excluding tertiary butyl;

Ar is

and

R_2 and R_3 each independently represent hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl having 1 to 4 carbon atoms, lower alkoxy, trifluoromethyl or

R_2 and R_3 together independently represent methylenedioxy attached to adjacent carbon atoms,

provided that when R_2 and R_3 are independently trifluoromethyl or tertiary butyl they are not on adjacent carbon atoms, or a pharmaceutically acceptable acid addition salt thereof.

3,932,431

CERTAIN 2-[G2(2-PYRIDYL)-BENZYL] IMIDAZOLINES AND DERIVATIVES THEREOF

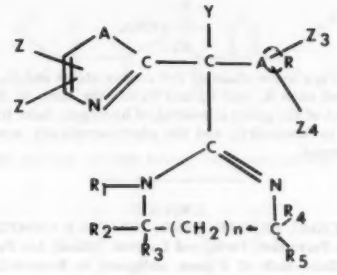
Lewis A. Walter, Madison, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 49,578, June 24, 1970, Pat. No. 3,770,737, which is a continuation of Ser. No. 704,263, Feb. 9, 1968, abandoned. This application Nov. 5, 1973, Ser. No. 412,852

Int. Cl.² C07D *213/44*

U.S. Cl. 260—296 R **15 Claims**

1. A compound selected from the group consisting of cyclic amidines of the structural formula:



I

and the pharmaceutically acceptable acid addition salts thereof, wherein n is an integer of the group consisting of zero and one; A is a member of the group consisting of —C=C, —C=N, and —S—; wherein A together with the ring atoms to which it is attached represents a heterocycle of the group consisting of pyridyl, pyrimidinyl, and thiazoyl each of Z_1, Z_2 and Z_3 is a member of the group consisting of hydrogen, lower alkyl, and trifluoromethyl, lower alkoxy and halogen and Z_4 is a member of the group consisting of hydrogen, lower alkyl, trifluoromethyl, lower alkoxy, halogen and diloweralkylamino;

represents a member of the group consisting of phenyl, thienyl and pyridyl; Y represents a member of the group consisting of hydroxy, lower alkoxy and lower alkanoyloxy containing 2 to 6 carbon atoms; R_1 represents a member of the group consisting of hydrogen, lower alkyl, aminoloweralkyl, hydroxyloweralkyl, benzyl and phenethyl; each of R_2, R_3, R_4 and R_5 are members of the group consisting of hydrogen and lower alkyl.

3,932,432

ALKYLPHENYL BENZOPYRANOPYRIDINES

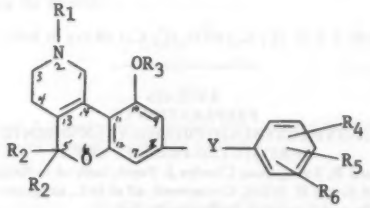
Martin Winn, Deerfield, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 345,942, April 2, 1973, abandoned. This application Feb. 13, 1974, Ser. No. 442,032

Int. Cl.² C07D *213/30*

U.S. Cl. 260—297 T **8 Claims**

1. A compound of the formula



where R_1 is hydrogen, loweralkyl, 3-methyl-2-butenyl, 3-chloro-2-propenyl, cyclopropylmethyl, phenylloweralkyl, or 3(3,4,5-trimethoxyphenyl)-2-propenyl; R_2 is methyl; R_3 is hydrogen; Y is a radical of the formula

where n is a linear chain of 1–9 carbon atoms and R_7 is H or CH_3; and each R_4 and R_5 and R_6 are the same or different members of the group consisting of hydrogen, halo, trifluoromethyl or loweralkyl; and the pharmaceutically acceptable salts thereof.

3,932,433

PESTICIDAL PHOSPHOROUS-THIAZOLE COMPOUNDS

Jacques Perronnet, Paris, and Laurent Taliani, Les Pavillons-sous-Bois, both of France, assignors to Roussel-UCLAF, Paris, France

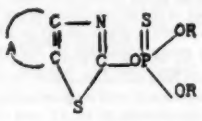
Filed Dec. 26, 1974, Ser. No. 536,424

Claims priority, application France, Jan. 8, 1974, 74.00536

Int. Cl.² C07D *277/60*

U.S. Cl. 260—302 E **8 Claims**

1. A compound of the formula



wherein A is polymethylene of 3 to 5 carbon atoms optionally substituted with a member of the group consisting of =0 and

wherein R′ is alkyl of 1 to 5 carbon atoms and R is alkyl of 2 to 3 carbon atoms.

3,932,434

N-2-(6-HYDROXYBENZOTHIAZOLYL)-N′-PHENYL (OR SUBSTITUTED PHENYL) UREAS

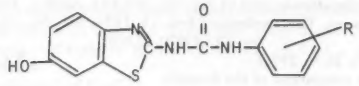
Charles J. Paget, Indianapolis, and James H. Wikel, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 30, 1974, Ser. No. 502,129

Int. Cl.² C07D *277/82*

U.S. Cl. 260—305 **5 Claims**

1. A compound of the formula



wherein R is H, (C_1–C_3) alkyl, (C_1–C_3) alkoxy or halo.

3,932,435

PREPARATION OF N-2-(6-HYDROXYBENZOTHIAZOLYL)-N′-PHENYL (OR SUBSTITUTED-PHENYL) UREAS

Edward R. Lavagnino; Charles J. Paget, both of Indianapolis, and James H. Wikel, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

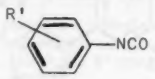
Filed Aug. 30, 1974, Ser. No. 502,130

Int. Cl.² C07D *277/82*

U.S. Cl. 260—305 **1 Claim**

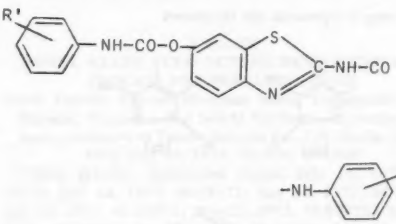
1. The process which comprises the essential steps

1. reacting 2-amino-6-hydroxy-benzothiazole with from 1-2 moles of a phenyl isocyanate of the formula

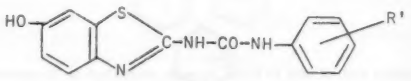


wherein R′ is H, (C_1–C_3) alkyl, (C_1–C_3) alkoxy or halo;

2. hydrolyzing any thus-obtained 6-carbamoyloxy compound of the formula



wherein R′ has the same meaning as hereinabove; with a base of the group comprising alkali metal hydroxides, and carbonates, ammonium hydroxide and (C_1–C_3) alkyl-substituted ammonium hydroxides in an inert solvent at a temperature not higher than about 100°C. until the 6-carbamoyloxy derivative is converted substantially completely to the corresponding 6-hydroxy derivative of the formula



wherein R′ has the same meaning as hereinabove; and then

3. isolating said 6-hydroxy derivative.

3,932,436

2-THIAZOLONE-5-CARBOXYLIC ACID ESTER FUNGICIDAL AGENTS

Klaus Grohe, Cologne, and Paul-Ernst Frohberger, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

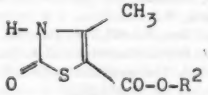
Filed Oct. 26, 1973, Ser. No. 410,073

Claims priority, application Germany, Oct. 28, 1972, 2253027

Int. Cl.² C07D *277/22*

U.S. Cl. 260—306.7 R **3 Claims**

1. 2-thiazolone-5-carboxylic esters of the formula



in which

R^2 is alkyl of four to eight carbon atoms, cyclohexyl, cyclohexylmethyl, cyclohexylethyl or phenyl ethyl.

3,932,437

MULTISTEP SYNTHESIS FOR CERTAIN 1,3,4-THIADIAZOLES AND INTERMEDIATE

William C. Doyle, Jr., Leawood, and Loren W. Hedrich, Overland Park, both of Kans., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

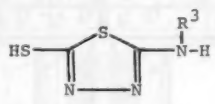
Division of Ser. No. 177,178, Sept. 1, 1971, Pat. No. 3,824,247, which is a continuation-in-part of Ser. No. 119,417, Feb. 26, 1971. This application Aug. 13, 1973, Ser. No. 387,839

Int. Cl.[2] C07D *277/52*

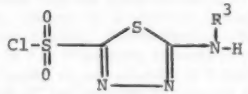
U.S. Cl. 260—306.8 D 3 Claims

1. The method of manufacturing a herbicidal composition consisting of the following steps, performed in sequence:

a. Chlorinating under oxidizing conditions an amine having the structural formula

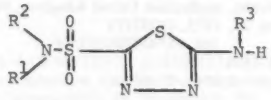


in which R^3 may be methyl or ethyl to yield a corresponding sulfonyl chloride having the structural formula

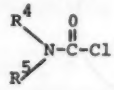


b. reacting the sulfonyl chloride produced in Step (a) with a secondary amine of the structural formula

in which R^1 may be hydrogen or C_1 to C_4 lower alkyl and R^2 may be hydrogen or C_1 to C_4 lower alkyl or R^1 and R^2 together may form a morpholino ring with the nitrogen atom to yield a sulfonamide having the structural formula

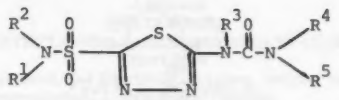


c. reacting the sulfonamide produced in step (b) with a carbamyl chloride or isocyanate having one of the structural formulae

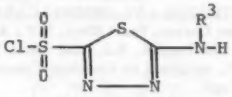


or R^4NCO or reacting the amine substituent group with phosgene in an inert solvent, followed by reacting the resulting carbamyl chloride with an amine having the structural formula

in which R^4 may be hydrogen, methyl or ethyl and R^5 may be hydrogen or C_1 to C_4 lower alkyl to yield a phytotoxic ureidothiadiazolesulfonamide having the structural formula



3. The sulfonyl chloride having the structural formula



in which R^3 is methyl or ethyl.

3,932,438

1-(5-TRIFLUOROMETHYL-1,3,4-THIADIAZOL-2-YL)-3-ETHYL-5-HYDROXY-1,3-IMIDAZOLIDIN-2-ONE

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 375,203, June 29, 1973, abandoned. This application Feb. 11, 1974, Ser. No. 441,611. The portion of the term of this patent subsequent to Aug. 26, 1992, has been disclaimed.

Int. Cl.[2] C07D *285/12*

U.S. Cl. 260—306.8 D 1 Claim

1. The compound 1-(5-trifluoromethyl-1,3,4-thiadiazol-2-yl)-3-methyl-5-hydroxy-1,3-imidazolidin-2-one.

3,932,439

N-SUBSTITUTED CYCLOSERINE COMPOUNDS, SALTS THEREOF, AND PROCESSES FOR PREPARING THEM

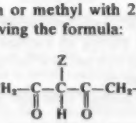
Norman P. Jensen, Watchung, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 384,545, Aug. 1, 1973, abandoned. This application May 28, 1974, Ser. No. 473,164

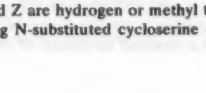
Int. Cl.[2] C07D *261/04*

U.S. Cl. 260—307 A 16 Claims

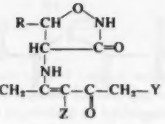
1. A process which comprises the step of reacting, at a temperature of about 0° to 35°C., a cycloserine compound having the formula



wherein R is hydrogen or methyl with 2,4-pentanedione, or derivatives thereof, having the formula:



wherein X, Y and Z are hydrogen or methyl thereby forming the corresponding N-substituted cycloserine compound having the formula:



wherein R, X, Y and Z have the significance above-defined.

3,932,440

P-(1H-TETRAZOL-1-YL)-PHENYLCARBAMATES

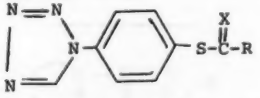
William Vincent Curran, Pearl River, N.Y.; Andrew Stephen Tomcufcik, Old Tappan, N.J., and Adma Schneller Ross, Suffern, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 3, 1974, Ser. No. 475,478

Int. Cl.² C07D *257/04*

U.S. Cl. 260—308 D **10 Claims**

1. A compound of the formula:



wherein R is a moiety of the formulae:

$-CH_3$, $-NHCH_3$, $-N(CH_3)_2$, $-NHC_2H_5$, $-N(C_2H_5)_2$, $-NHCH_2CH{=}CH_2$ or $-NH-C-CCl_3$

and X is divalent oxygen or divalent sulfur.

3,932,441

PROCESS FOR THE PRODUCTION OF PURE TETRAZOLE-1-ACETIC ACID

Günter Bison, Troisdorf; Walter Heinzelmann, Leverkusen; Norbert Linkat, St. Augustin, and Wolfgang Wolfes, Mondorf, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Sept. 27, 1974, Ser. No. 509,858

Claims priority, application Germany, Sept. 28, 1973, 2348802

Int. Cl.² C07D *257/04*

U.S. Cl. 260—308 D **5 Claims**

1. In a process for the production of tetrazole-1-acetic acid from a crude reaction product containing an ester of said acid, wherein the crude reaction product is treated to isolate the ester and the ester is hydrolyzed to form the acid, the improvement which comprises effecting a falling-film molecular distillation of the reaction product that contains an alkyl ester of tetrazole-1-acetic acid with 1–4 carbon atoms in the alkyl group at temperatures of below 130°C. under a vacuum of $<10^{-1}$ torr to obtain a distillate containing a purified alkyl ester which can be hydrolyzed to provide tetrazole-1-acetic acid of maximum purity.

3,932,442

PROCESS FOR SCREENING MATERIALS WITH VIBRATING SCREENS

John Kennedy Salmon, Glen Cove, and Richard A. Adie, Hauppauge, both of N.Y., assignors to Lundy Electronics & Systems, Inc., Glen Head, N.Y.

Filed Aug. 27, 1973, Ser. No. 392,012

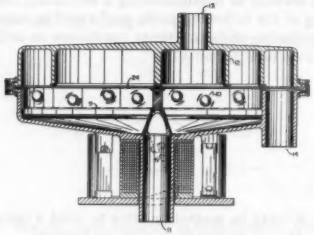
Int. Cl.² B07H *1/36*

U.S. Cl. 209—309 **6 Claims**

1. A process for screening materials by means of a substantially planar screen having an entrance surface facing generally upwardly and an exit surface facing generally downwardly comprising the steps of:

a. feeding the materials onto the entrance surface of the screen,

b. vibrating the screen by producing a translational oscillation of the screen in directions normal to the plane of the screen and a torsional oscillation of the screen about an axis normal to the plane of the screen, so that each point of the screen moves in a helical path, the translational oscillation of the screen being such that the acceleration of the screen normal to the plane of the screen is at least 1 g (32.2 feet/second²) during some portion of each vibrational cycle,



c. utilizing the torsional oscillation of the screen to transport screen retentate to an exit port disposed generally in the plane of the screen at a location spaced from the axis of torsional oscillation,

d. collecting the screen retentate at the exit port, and

e. collecting the screened material below the exit surface of the screen.

3,932,443

SULPHOXIDES

George Raymond White, Harpenden, England, assignor to Smith Kline & French Laboratories, Inc., Welwyn Garden City, England

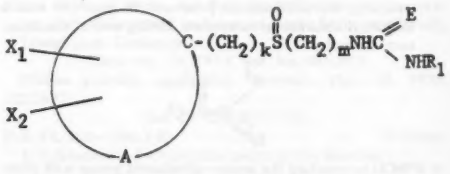
Filed Jan. 24, 1974, Ser. No. 436,285

Claims priority, application United Kingdom, Feb. 8, 1973, 6153/73; Oct. 23, 1973, 49257/73

Int. Cl.² C07D *233/64*

U.S. Cl. 260—309 **8 Claims**

1. A compound of the formula:



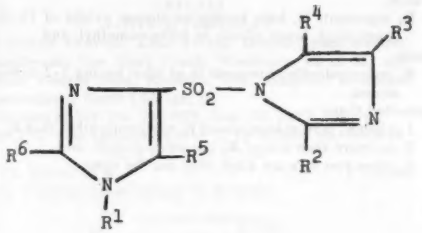
wherein A is such that the heterocyclic nucleus formed is an imidazole ring; X_1 and X_2, which may be the same or different, are hydrogen, lower alkyl, trifluoromethyl, hydroxyl, halogen or amino; k is 0 to 2 and m is 2 or 3 provided that the sum of k and m is 3 or 4; E is oxygen, sulphur or NR_2; R_1 is hydrogen, lower alkyl, benzoyl or dimethylaminoethyl; and R_2 is hydrogen, nitro, cyano, alkanesulphonyl having 1—3 carbon atoms, benzenesulphonyl, halobenzenesulphonyl or toluenesulphonyl.

3,932,444
4-IMIDAZOLYLSULFONYLIMIDAZOLES

Richard Lee Ellis, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 248,596, April 28, 1972, abandoned. This application Feb. 26, 1974, Ser. No. 445,913
Int. Cl.² C07D 233/84
U.S. Cl. 260—309 8 Claims

1. A compound of the formula



wherein

R^1 is selected from the group consisting of H, alkyl of 1–3 carbons, alkenyl of 3 carbons, aminocarbonyl, methylaminocarbonyl, dimethylaminocarbonyl, benzoyl, aralkyl of 7 to 19 carbons, alkanoyl of up to 7 carbons, benzoylmethyl or cycloalkanoyl of 4 carbons;

R^2, R^3 and R^4 are individually selected from the group consisting of H, alkyl of up to 17 carbons; cycloalkyl of up to 6 carbons, aryl of 6–12 carbons substituted with up to two halo, nitro, amino, methoxy or alkyl groups having up to 3 carbons; alkenyl of 3 carbons; carbalkoxyalkyl and carbalkoxyalkenyl of 3–4 carbons; and thioalkyl of 1–2 carbons;

with the proviso that R^3 and R^4 together can be a divalent hydrocarbyl group of 4 chain carbons and having a total of from 4 to 8 carbons; and

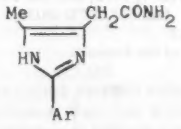
R^5 and R^6 individually are H or alkyl of 1–3 carbons.

3,932,445
2-ARYL-4-(R-METHYL)-5-METHYLIMIDAZOLES

Chris Royce Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Incorporated, Ft. Washington, Pa.

Filed June 26, 1974, Ser. No. 483,480
Int. Cl.² C07D 233/64
U.S. Cl. 260—309 2 Claims

1. A compound selected from the group consisting of 2-aryl-5-methylimidazole-4-acetamide having the formula:



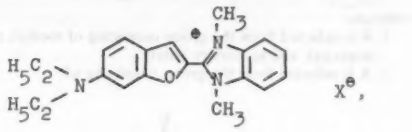
and mineral acid addition salts thereof, wherein Ar is a member selected from the group consisting of phenyl, methylenedioxyphenyl, loweralkanoylphenyl, loweralkylthiophenyl and phenyl substituted with 1 to 3 members selected from the group consisting of loweralkyl, loweralkoxy, halo, hydroxy, phenoxy and nitro.

3,932,446
QUATERNIZED 6-DIETHYLAMINO-2-[BENZIMIDAZOLYL-(2)]BENZOFURAN

Klaus Grychtol, Bad Duerkheim, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Sept. 6, 1973, Ser. No. 394,659
Claims priority, application Germany, Sept. 9, 1972, 2244371
Int. Cl.² C07D 235/14
U.S. Cl. 260—309.2 2 Claims

1. A benzofuran compound of the formula



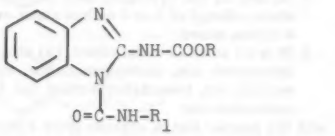
in which $X^{\ominus}$ is $HSO_4^{\ominus}$, $CH_3SO_4^{\ominus}$, $Cl^{\ominus}$, $Br^{\ominus}$, ½ $SNCl_4^{2\ominus}$ or $CH_3COO^{\ominus}$

3,932,447
BENZIMIDAZOLES

Jacques Perronnet, and Pierre Girault, both of Paris, France, assignors to Roussel-UCLAF, Paris, France

Filed Sept. 18, 1973, Ser. No. 398,416
Claims priority, application France, Sept. 27, 1972, 72.34135
Int. Cl.² C07D 235/26
U.S. Cl. 260—309.2 5 Claims

1. A benzimidazole of the formula



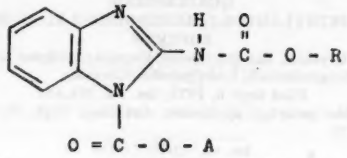
wherein R is alkyl of 1 to 2 carbon atoms and R_1 is selected from the group consisting of tetrahydrofurfuryl, pyranyl, dihydropyranyl, tetrahydrofuranyl and tetrahydropyranyl.

3,932,448
2-(ALKOXYCARBONYLAMINO)-1-BENZIMIDAZOLECARBOXYLIC ACID ESTERS WITH HYDROXYALIPHATIC ACIDS AND DERIVATIVES THEREOF

Frederic J. Baude, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

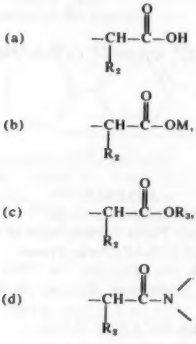
Continuation-in-part of Ser. No. 116,247, Feb. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 776,273, Nov. 15, 1968, abandoned. This application July 19, 1973, Ser. No. 380,601
Int. Cl.² C07D 235/32
U.S. Cl. 260—309.2 9 Claims

1. A compound having the formula:



wherein:

1. R is selected from the group consisting of methyl, ethyl, isopropyl, and secondary butyl;
2. A is selected from the group consisting of:



3. R_2 is hydrogen, or alkyl of 1 through 14 carbon atoms;
4. R_3 is alkyl of 1 through 4 carbon atoms, alkenyl of 3 or 4 carbon atoms, or alkynyl of 3 or 4 carbon atoms;
5. R_4 and R_5 are hydrogen, alkyl of 1 through 4 carbon atoms, alkenyl of 3 or 4 carbon atoms or alkynyl or 3 or 4 carbon atoms
6. M is (i) an alkali metal cation, (ii) an ion selected from ammonium ion, methylammonium ion, dimethylammonium ion, trimethylammonium ion and tetramethylammonium ion;

with the proviso that A contains from 2 through 17 carbon atoms.

3,932,449

5-(P-DIMETHYLAMINOBENZYL) HYDANTOIN

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Oct. 9, 1973, Ser. No. 404,171
Int. Cl.² C07D 49/32
U.S. Cl. 260—309.5 **1 Claim**

1. The compound 5-(p-dimethylaminobenzyl)hydantoin.

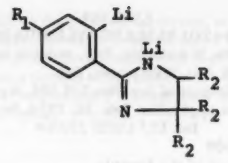
3,932,450

INTERMEDIATES IN THE PREPARATION OF IMIDAZO(2,1-ALPHA)ISOINDOLES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Aug. 19, 1974, Ser. No. 498,273
Int. Cl.² C07D 49/34
U.S. Cl. 260—309.6 **4 Claims**

1. A compound of the formula



where

R_1 represents H, halo having an atomic weight of 19–36, lower alkyl, lower alkoxy or trifluoromethyl, and each

R_2 independently represents H or alkyl having 1–2 carbon atoms,

provided that

1. when R_1 is H, at least one of R_2 represents other than H,
2. no more than two of R_2 are other than H, and
3. when two R_2's are alkyl, they are the same.

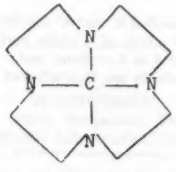
3,932,451

1,4,7,10-TETRAAZATETRACYCLO[5.5.1.0^{4,13}.0^{10,13}]TRIDECANE AND ITS CONJUGATE ACIDS

John Howard Bigelow, Rochester, N.Y., and Jack E. Richman, Wilmington, Del., assignors to E. I. D Pont de Nemours & Company, Wilmington, Del.

Filed Nov. 27, 1973, Ser. No. 419,441
Int. Cl.² C07D 49/34
U.S. Cl. 260—309.6 **5 Claims**

1. A compound having the formula



and salts thereof with an acid selected from the group consisting of hydrochloric, sulfuric, nitric, acetic, tartaric and lactic.

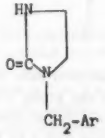
3,932,452

1-ARYLMETHYL-2-IMIDAZOLIDINONES

Thomas J. Schwan, and Nelson J. Miles, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Feb. 7, 1975, Ser. No. 547,925
Int. Cl.² C07D 49/34
U.S. Cl. 260—309.7 **12 Claims**

1. A compound of the formula:



wherein Ar is selected from the group consisting of benzhydryl, 2-naphthyl, 5-bromo-2-naphthyl,[4-pyridyl]and

wherein R is 2-fluoro, 4-bromo, 2,6-dichloro, 2,4-dichloro, 2-hydroxy-5-nitro, 4-benzyloxy, 3,4-difluoro or 4-cyano.

3,932,453

4-NITROPYRAZOLES

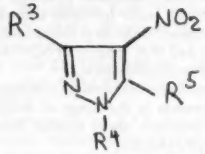
Aldo Joseph Crovetti, Lake Forest; Donald Sykes Kenney, Northbrook; Don Murl Lynch, Waukegan, all of Ill., and Robert George Stein, Kenosha, Wis., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 282,889, Aug. 21, 1972, Pat. No. 3,869,274. This application May 2, 1974, Ser. No. 466,424

Int. Cl.² C07D *231/00*

U.S. Cl. 260—310 R **8 Claims**

1. A 4 nitropyrazole having the formula



where R^5 is halo, R^4 is hydrogen and R^3 is alkyl.

3,932,454

PROCESS OF MAKING HEXAGONAL ALPHA METAL-FREE PHTHALOCYANINE

Ray H. Luebbe, Jr., Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 846,262, July 30, 1969, abandoned. This application Aug. 7, 1973, Ser. No. 386,468

Int. Cl.² C09B *47/08*

U.S. Cl. 260—314.5 **7 Claims**

1. A method for the preparation of substantially hexagonal crystals of alpha metal-free phthalocyanine, said crystals ranging in size from about 1 micron to about 75 microns which comprises mixing a phthalocyanine selected from the group consisting of unsubstituted alpha metal-free phthalocyanine, unsubstituted beta metal-free phthalocyanine, and mixtures thereof in a solution of a strong base selected from at least one member of the group consisting of alkoxides of an alkali metal, hydroxides of an alkali metal, alkoxides of a quaternary ammonium radical, and hydroxides of a quaternary ammonium radical satisfying the following formula

$$(R'R_{1-3}N)+$$

wherein R′ may be an aromatic, heterocyclic, or aliphatic radical; and R_{1-3} is an aliphatic radical

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3,932,455

CARBAZOLE PHTHALEINS

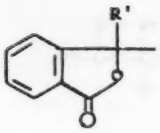
Ruth C. Bilofsky, Arlington, Mass., and Richard D. Cramer, Wallingford, Pa., assignors to Polaroid Corporation, Cambridge, Mass.

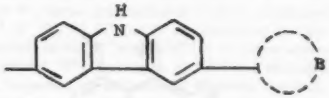
Continuation-in-part of Ser. No. 202,482, Nov. 26, 1971, Pat. No. 3,816,119. This application May 22, 1974, Ser. No. 472,162

Int. Cl.² C07D *209/86*

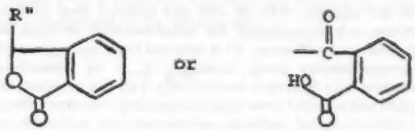
U.S. Cl. 260—315 **52 Claims**

1. An indicator dye of the formula:

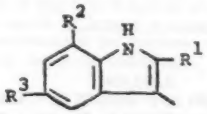


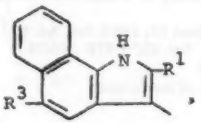


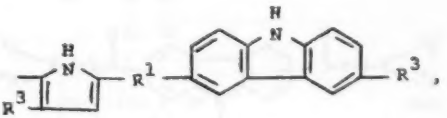
wherein B represents

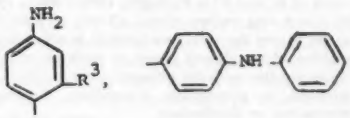


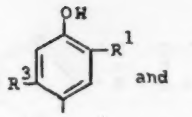
wherein R′ and R″ the same are selected from



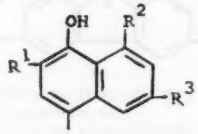








and



wherein R^1 is selected from hydrogen, alkyl having 1 to 20 carbon atoms, phenyl and a hydrogen-bonding group forming a 5-, 6- or 7-membered intramolecular hydrogen-bonded ring with the adjacent -NH- or -OH and selected from carboxy, hydroxy, o-hydroxyphenyl, bis trifluoromethyl carbinol, sulfonamido and sulfamoyl, R^2 is selected from hydrogen and a hydrogen-bonding group forming a 5-, 6- or 7-membered intramolecular hydrogen-bonded ring with the adjacent -NH or -OH and selected from carboxy, hydroxy, o-hydroxyphenyl, bis trifluoromethyl carbinol, sulfonamido and sulfamoyl, not more than one of R^1 and R^2 being a hydrogen-bonding group, and R^3 is selected from hydrogen, phenyl, aikyl having 1 to 20 carbon atoms and alkoxy having 1 to 20 carbon atoms.

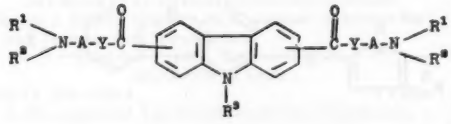
3,932,456

BIS-BASIC ESTERS AND AMIDES OF CARBAZOLE

William L. Albrecht, and Robert W. Fleming, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed June 16, 1969, Ser. No. 833,718
Int. Cl.² C07D *209/88*
U.S. Cl. 260—315 **15 Claims**

1. A compound of the formula



wherein:

A. each of R^1 and R^2 is hydrogen, (lower)alkyl, cycloalkyl of 3 to 6 ring carbon atoms, alkenyl of 3 to 6 carbon atoms having the vinyl unsaturation in other than the 1-position of the alkenyl group, or each set of R^1 and R^2 taken together with the nitrogen atom to which they are attached is pyrrolidino, piperidino, N-(lower)alkylpiperazino, or morpholino;

B. each A is alkylene of 2 to about 8 carbon atoms and separates its adjacent Y and amino nitrogen by an alkylene chain of at least 2 carbon atoms;

C. each Y is oxygen, or N-R wherein R is hydrogen, methyl or ethyl; and

D. R^3 is hydrogen or (lower) primary or secondary alkyl, or an acid addition salt thereof.

3,932,457

PYROLYSIS OF N-SUBSTITUTED-1-CYCLOHEXENE-1,2-ICARBOXIMIDES

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 16, 1973, Ser. No. 360,962
Int. Cl.² C07D *209/52, 209/54*
U.S. Cl. 260—326 C **5 Claims**

1. The process of pyrolysis wherein N-phenyl or N-alkyl substituted-1-cyclohexene-1,2-dicarboximide and N-phenyl or N-alkyl substituted-maleimide pyrolyze in substantially equimolar relationship under pyrolysis conversion conditions to the dimer of N-phenyl or N-alkyl substituted-1,3-butadiene-2,3-dicarboximide and N,N′-phenyl or N,N′-alkyl substituted-3,4,5,6-tetrhydropyromellitdiimide,

wherein said pyrolysis conversion conditions include elevated temperatures in the range of about 500° to 1000° C., reduced pressure, short contact time, effective for said process of pyrolysis.

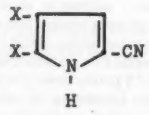
3,932,458

ANTIMICROBIAL AND PLANT-ACTIVE 4,5-DIHALOPYRROLE-2-CARBONITRILES

Denis M. Bailey, Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 195,817, Nov. 4, 1971, Pat. No. 3,864,491.
This application Feb. 19, 1974, Ser. No. 443,740
Int. Cl.² C07D *207/46*
U.S. Cl. 260—326.62 **4 Claims**

1. A compound having the formula



where X is chlorine, bromine or iodine.

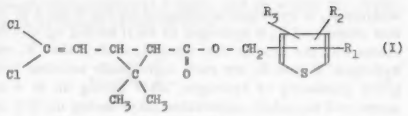
3,932,459

NOVEL CYCLOPROPANECARBOXYLIC ACID ESTERS

Yoshitoshi Okuno, Toyonaka; Masachika Hirano, Ashiya; Isao Ohno, Minoo; Hisami Takeda, Takarazuka; Osamu Magara, Osaka; Nobushige Itaya, Nishinomiya; Toshio Nishioka, Takarazuka; Toshio Mizutani; Nobuo Ohno, both of Toyonaka, and Takashi Matsuo, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed July 25, 1974, Ser. No. 491,636
Claims priority, application Japan, July 30, 1973, 48-86121
Int. Cl.² C07D *333/24*
U.S. Cl. 260—332.2 A **3 Claims**

1. A compound of the formula,



(I)

wherein R_1 is alkyl having up to four carbon atoms, alkenyl having up to five carbon atoms, cycloalkenyl having up to six carbon atoms, alkynyl having up to five carbon atoms, benzyl, phenoxy or halogen; R_2 and R_3 are hydrogen, halogen or methyl; and any adjacent two of R_1, R_2 and R_3 may conbine to form polymethylene.

3,932,460
METHOD FOR THE PREPARATION OF A TETRAALKYL-TETRAOXA-UNDECANE

David R. McCoy, Wappingers Falls; Terence B. Jordan, Fishkill, and Frank K. Ward, Hopewell Junction, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed June 27, 1974, Ser. No. 483,600
Int. Cl.² C07D *319/06*
U.S. Cl. 260—340.7 7 Claims

1. A method of preparing a 3,3,9,9,-tetraalkyl- 2,4,8,10-tetraoxa [5,5] undecane wherein each alkyl group contains from one to about 14 carbon atoms therein and the total number of carbon atoms in the four alkyl groups is in the range of 18 to 30, which consists essentially of reacting from 2 to 4 moles of a C_{10}–C_{16} aliphatic ketone per mole of pentaerythritol in the presence of para-toluene sulfonic acid catalyst in a reaction solvent selected from the group consisting of xylene and monochlorobenzene at a temperature in the range of from about 120°C. to about 150°C., for a reaction period of from avout 7 to 70 hours while removing water of formation by azeotropic distillation and thereafter recovering said formed tetraalkyl-tetraoxaundecane from the resulting reaction products.

3,932,461
N-[4-(3,4-METHYLENEDIOXYPHENYL)-BUT-2-YL]-β-(3,4-DIHYDROXYPHENYL)ETHYLAMINE, AND SALTS THEREOF

John T. Suh, Mequon, Wis., assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed June 28, 1974, Ser. No. 484,096
Int. Cl.² C07D *317/58*
U.S. Cl. 260—340.5 3 Claims

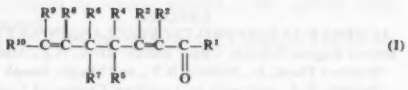
1. The compound N-(3,4-methylenedioxyphenisobutyl)-3,4-dihydroxyphenethylamine, and pharmaceutically acceptable salts thereof.

3,932,462
MANUFACTURE OF UNSATURATED KETONES

Norbert Goetz, Bobenheim-Roxheim, and Roman Fischer, Mutterstadt, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

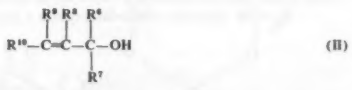
Filed Nov. 13, 1973, Ser. No. 415,414
Claims priority, application Germany, Nov. 17, 1972, 2256347
Int. Cl.² C07D *319/06*
U.S. Cl. 260—340.7 11 Claims

1. A process for the manufacture of α,β-unsaturated ketones of the formula I:



(I)

in which R^1 is alkyl of from 1 to 4 carbon atoms, or R^1, together with R^4 or R^5, forms unsubstituted or alkyl-substituted alkylene, R^2, R^3, R^4, R^5, R^6, R^7 and R^8 are hydrogen or alkyl of from 1 to 4 carbon atoms, R^9 is alkyl of 1 to 4 carbon atoms or, when R^{10} is phenyl, R^9 is hydrogen, and R^{10} is a saturated or unsaturated, branched or unbranched aliphatic, cycloaliphatic or cycloaliphatic/aliphatic hydrocarbon radical of up to 12 carbons in which C—C bonds may be interrupted by oxygen or the group —O—CO—, or unsubstituted phenyl, wherein an allyl alcohol of the formula II:



(II)

in which R^6 to R^{10} have the meanings stated above, is reacted with a compound of the formula IIIa:

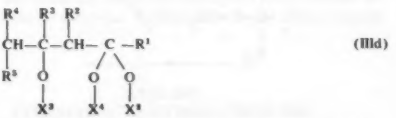
(IIIa)

in which R^1 to R^5 have the meanings stated above and X^1 is alkyl or acyl of from 1 to 6 carbons or cycloalkyl, or with a compound capable of forming a compound of formula IIIa under the conditions of the reactions, said compound being selected from the group consisting of a compound of the formulae

(IIIb)

(IIIc)

, and



(IIId)

in which formulae IIIb, c and d R^1 to R^5 have the meanings given above and X^2, X^3 and X^4 may be the same or different and stand for alkyl or acyl of from 1 to 6 carbon atoms or cycloalkyl or X^4 and X^2 together form unsubstituted or alkyl-substituted alkylene at temperatures of from 120° to 350° in the presence of from 0.01 to 5% by weight of the total weight of reactants of an acid having a pK value of from 1 to 5.5 or in the presence of from 0.001 to 0.1% by weight of the total weight of reactants of an acid having a pk value of less than 1, in the liquid phase.

3,932,463

11-DEOXY-13-DIHYDRO-PROSTAGLANDIN-9-KETALS

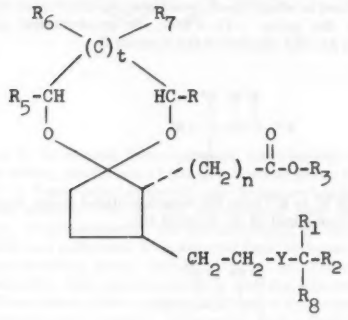
Robert Eugene Schaub, Upper Saddle River, N.J.; Middleton Brawner Floyd, Jr., Suffern, N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 3, 1974, Ser. No. 475,479

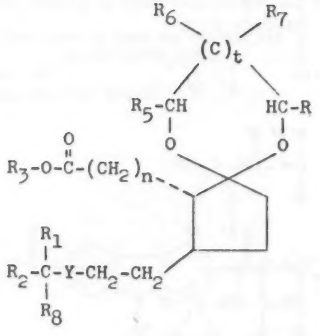
Int. Cl.² C07D *317/30, 319/04*

U.S. Cl. 260—340.7 **28 Claims**

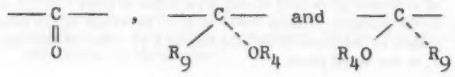
1. A racemate consisting of enantiomeric cyclic ketals of the formulae:



and



wherein Y is a divalent moiety selected from the group consisting of those of the formulae:



wherein R_4 is hydrogen or alkanoyl having from 2 to 15 carbon atoms and R_9 is hydrogen or alkyl having up to 4 carbon atoms with the proviso that when R_9 is alkyl then R_4 must be hydrogen; R and R_5 are each individually selected from the group consisting of hydrogen, alkyl having up to 4 carbon atoms and monohalo substituted alkyl having up to 4 carbon atoms; R_6 and R_7 are each individually selected from the group consisting of hydrogen and alkyl having up to 4 carbon atoms; R_1 and R_8 are each individually selected from the group consisting of hydrogen, fluoro and alkyl having up to 4 carbon atoms; R_2 is alkyl having from 2 to 7 carbon atoms; R_3 is selected from the group consisting of hydrogen and alkyl having from 1 to 12 carbon atoms; n is an integer from 4 to 8, inclusive, and t is zero or one; and the pharmacologically acceptable cationic salts thereof when R_3 is hydrogen.

3,932,464

SILICEOUS DIOXOLANE DERIVATIVES

Hans-Joachim Kötzsch, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, Baden, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Bez. Cologne, Germany

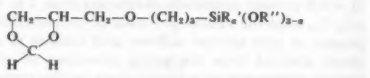
Division of Ser. No. 310,495, Nov. 29, 1972, Pat. No. 3,829,567. This application May 14, 1974, Ser. No. 469,937

Claims priority, application Germany, Dec. 3, 1971, 2159991

Int. Cl.² C07F *7/18*

U.S. Cl. 260—340.9 **3 Claims**

1. A siliceous dioxolane derivative of the formula:



wherein *a* is 0 or 1 and R′ and R″ each represents lower alkyl wherein the R″ 's can be the same or different.

3,932,465

3-R-METHYL-7-AMINO-CEPH-EM-4-CARBOXYLIC ACID COMPOUNDS

Heinrich Peter, Riehen, Switzerland; Herman Robert Rodriguez, New York, N.Y., and Hans Bickel, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

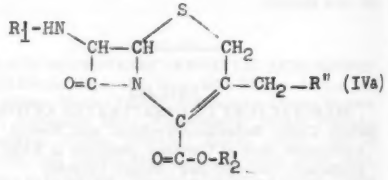
Filed July 2, 1971, Ser. No. 159,527

Claims priority, application Switzerland, July 8, 1970, 10305/70

Int. Cl.² C07D *501/20*

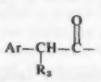
U.S. Cl. 260—243 C **10 Claims**

1. Compounds having the formula



in which R″ represents 2- or 4-hydroxy-phenyl, 2,5- or 3,4-dihydroxy-phenyl, 2- or 4-lower alkoxy-phenyl, 2,4-, 2,5- or 3,4-dimethoxy-phenyl, 2- or 4-lower alkanoyloxy-phenyl, 4-lower alkylthio-phenyl, 2-thienyl, 2-furyl, 5-carboxy-2-furyl

or 5-lower alkoxycarbonyl-2-furyl, and in which R_1' represents an acyl radical of the formula



(Ic)

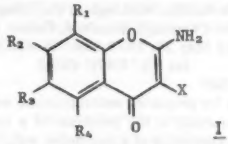
in which Ar represents phenyl, 3- or 4-hydroxy-phenyl, 3-chloro-4-hydroxy-phenyl, 3,5-dichloro-4-hydroxy-phenyl or thienyl, and R_3 represents hydrogen, amino, t-lower alkoxycarbonylamino, 2-halogenolower alkoxycarbonylamino, guanylureido, sulphoamino, carboxyl or sulpho, and R_2' represents hydrogen or tert.-lower alkyl, 2-halogenlower alkyl, phenacyl, benzhydryl, 4,4'-dimethoxy-diphenylmethyl or lower alkanoyloxymethyl, and pharmaceutically acceptable salts of such compounds having salt-forming groups.

3,932,466
SUBSTITUTED 2-AMINO CHROMONES AND PROCESS FOR THE PREPARATION THEREOF

Richard E. Brown, Hanover, and David M. Lustgarten, Dover, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 13, 1974, Ser. No. 532,417
Int. Cl.² C07D 7/34
U.S. Cl. 260—345.2 **13 Claims**

1. A compound of the Formula I:



I

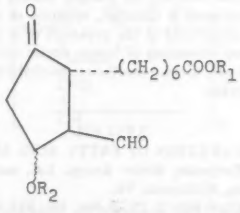
wherein R_1, R_2, R_3, and R_4 each represent hydrogen, hydroxy, lower alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms, halogen or phenyl, with the proviso that at least three of R_1, R_2, R_3 and R_4 are hydrogen; and X represents cyano or carboxamido.

3,932,467
PROCESS FOR THE PRODUCTION OF 2β-FORMYL 3α-ROTECTED HYDROXY-5-OXOCYCLOPENTANE-1α-HEPTANOIC ACIDS AND ESTERS CORRESPONDING

Masateru Miyano, Morton Grove, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

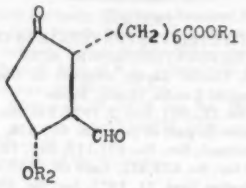
Continuation-in-part of Ser. No. 187,853, Oct. 8, 1971, Pat. No. 3,810,936, which is a continuation-in-part of Ser. No. 799,965, Feb. 17, 1969, abandoned. This application Aug. 28, 1973, Ser. No. 392,317
Int. Cl.² C07F 7/18; C07D 309/06
U.S. Cl. 260—345.7 **5 Claims**

1. A compound of the formula



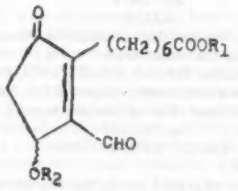
wherein R_1 is hydrogen or a lower alkyl, tetrahydropyran-2-yl,4-(lower alkoxy)tetrahydropyran-4-yl or tri(lower alkyl)silyl radical, R_2 is a tetrahydropryan-2-yl,4-(lower alkoxy)tetrahydropryan-4-yl or tri(lower alkyl)silyl radical and the wavy line represents the racemic mixture or the optically active 3(R) isomer.

2. A process for the production of a compound of the formula



(I)

wherein R_1 is hydrogen, a lower alkyl, tetrahydropyran-2-yl, 4-(lower alkoxy)tetrahydropyran-4-yl or tri(lower alkyl)silyl radical and R_2 is a tetrahydropyran-2-yl, 4-(lower alkoxy)tetrahydropyran-4-yl or tri(lower alkyl)silyl radical which comprises contacting a compound of the formula



(II)

wherein R_1 and R_2 are defined as above and the wavy line represents the racemic (RS) compound or the optically active R isomer, with chromous sulfate, chromous acetate or chromous perchlorate reducing agent, wherein the molar ratio of reducing agent to compound of formula II is about 2:1

3,932,468
DIHYDROFURAN PREPARATION

Victor P. Kurkov, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 8, 1974, Ser. No. 440,937
Int. Cl.² C07D 307/08
U.S. Cl. 260—346.1 R **10 Claims**

1. A process for preparing a substituted or unsubstituted dihydrofuran from a substituted or unsubstituted butadiene monoxide which comprises contacting the butadiene monoxide with a catalyst comprising a hydrogen halide selected from the group consisting of hydrogen iodide or bromide and a homogeneous transition metal compound in an inert organic solvent under liquid phase reaction conditions effective to convert the butadiene monoxide to the dihydrofuran, said reaction conditions including a temperature between 50° and 140°C, and wherein said transition metal is iron, manganese, cobalt, molybdenum, vanadium, copper or nickel, and wherein the transition metal is coordinated with suitable organic ligands to solubilize the transition metal in the organic solvent.

3,932,469
CITRACONIC ANHYDRIDE PROCESS

Rudolph G. Berg, Groton, and Bryce E. Tate, Neantic, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed June 3, 1974, Ser. No. 475,770
Int. Cl.² C07D 307/60
U.S. Cl. 260—346.8 R **8 Claims**

1. A process for preparing citraconic anhydride comprising contacting a gaseous mixture of a methyl butanol or a methyl butenol and oxygen with vanadium oxide at a temperature of from about 250° to 500°C, said methyl butanol and methyl butenol being 2-methyl-1-butanol, 2-methyl-2-butanol, 2-methyl-3-butanol, 2-methyl-4-butanol, 2-methylene-1-

butanol, 2-methyl-2-buten-1-ol, 2-methyl-3-buten-1-ol, 2-methyl-3-buten-2-ol, 3-methyl-2-buten-1-ol, 3-methyl-3-buten-1-ol, 3-methyl-3-buten-2-ol or a mixture thereof.

3,932,470

SUBSTITUTED FURFURYLESTERS OF CHRYSANTHEUMUMIC ACID

Yoshio Katsuda, Osaka, Japan, assignor to Dainippon Jochugiku Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 122,061, Feb. 2, 1971, Pat. No. 3,796,730, and a continuation-in-part of Ser. Nos. 809,036, March 20, 1969, abandoned, Ser. No. 691,173, Dec. 18, 1967, abandoned, and Ser. No. 629,422, April 10, 1967, abandoned. This application Sept. 21, 1973, Ser. No. 399,418

Int. Cl.² C07D *307/54*

U.S. Cl. 260—347.4 **1 Claim**

1. 3,4-dibromo-5-cyclopentadienylfurfurylester of chrysanthemumic acid.

3,932,471

AZIDE

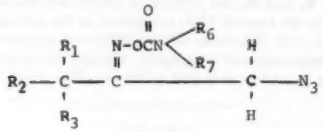
Thomas A. Magee, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 229,207, Feb. 24, 1972, Pat. No. 3,875,232, which is a continuation-in-part of Ser. No. 132,584, April 8, 1971, abandoned. This application Aug. 24, 1973, Ser. No. 391,329

Int. Cl.² C07C *117/00*

U.S. Cl. 260—349 **2 Claims**

1. A composition of matter having the structural formula:



where:

a. R_1 is R_5–R_9 or H;

b. R_5–R_9 is lower alkyl, lower alkenyl, lower alkynl, substituted lower alkyl, alkenyl, or alkynyl, with the proviso that R_5 and R_9 may be connected to form a cycloalkyl ring of not more than 6 carbon atoms;

c. R_6–R_7 is hydrogen, lower alkyl, lower alkenyl, or lower alkynyl.

3,932,472

NOVEL 15-SUBSTITUTED PROSTANOIC ACIDS AND ESTERS

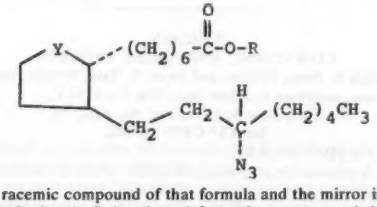
Robert Eugene Schaub, Upper Saddle River, and Martin Joseph Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 274,558, July 24, 1972, Pat. No. 3,835,179. This application May 9, 1974, Ser. No. 468,795

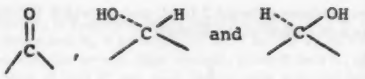
Int. Cl.² C07C *121/86*

U.S. Cl. 260—349 **12 Claims**

1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof wherein R is selected from the group consisting of hydrogen and an alkyl group having from one to twelve carbon atoms and Y is a divalent radical selected from the group consisting of those of the formulae:



and the pharmaceutically acceptable cationic salts thereof when R is hydrogen.

3,932,473

PROCESS FOR THE MANUFACTURE OF 1-NITRO-ANTHRAQUINONE

Erich Klauke, Odenthal-Hahnenberg; Reinhold Schmitz, Biecher, and Hans-Samuel Bien, Burscheid, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Apr. 20, 1973, Ser. No. 353,001

Claims priority, application Germany, Apr. 20, 1972, 2219216

Int. Cl.² C07C *79/37*

U.S. Cl. 260—369 **4 Claims**

1. Process for the manufacture of 1-nitro-anthraquinone by reacting anthraquinone and a nitrating agent for anthraquinone in aqueous hydrogen fluoride containing 5–30 percent water by weight at a temperature between 0°C and 150°C.

3,932,474

PREPARATION OF ANTRAQUINONE

Gregory Gerasimos Arzoumanidis, Stamford, Conn., and Francis Clyde Rauch, Warrington, Pa., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 28, 1974, Ser. No. 473,531

Int. Cl.² C07C *49/68*

U.S. Cl. 260—369 **8 Claims**

1. A process for preparing anthraquinone which comprises the steps of: reacting in the presence of a catalyst selected from the group consisting of a non-noble metal halide, a noble metal halide and mixtures of the same about equimolar amounts of benzene or benzophenone and carbon monoxide for from two to ten hours at a superatmospheric pressure of at least 200 pounds per square inch and at a temperature ranging from about 160°C to about 300°C, and recovering anthraquinone.

3,932,475

PROCESS FOR PRODUCING TRIMETHYL-P-BENZOQUINONE

Tetuo Miyazaki, Nara; Sunao Munemiya, Amagasaki, and Akira Tasaka, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed June 27, 1973, Ser. No. 374,165

Claims priority, application Japan, June 27, 1972, 47-64715; July 12, 1972, 47-70262; July 12, 1972, 47-70263; Sept. 7, 1972, 47-90224

Int. Cl.² C07C *49/64*

U.S. Cl. 260—396 R **10 Claims**

1. A process for producing trimethyl-p-benzoquinone, which comprises oxidizing 2,3,5-or 2,3,6-trimethyl-p-halogenophenol, wherein the halogen moiety in said trimethyl-p-halogenophenol is chlorine, bromine or iodine, by contacting with nitric acid in the presence of a solvent selected from the group consisting of water, acetic acid, hexane, heptane, chloroform, dichloromethane, methyl chloride and carbon tetrachloride.

3,932,476

PREPARATION OF FATTY ACID AMIDES

Charles R. Bergeron, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed July 2, 1973, Ser. No. 375,961

Int. Cl.² C07C *103/00*

U.S. Cl. 260—404 **10 Claims**

1. A process for preparing an amide of a fatty acid having from about 8 to about 20 carbon atoms per molecule compri-

ing reacting in a substantially anhydrous system (1) an ester of a fatty acid having from about 8 to about 20 carbon atoms per molecule and of a lower alcohol having from 1 to about 6 carbon atoms per molecule with (2) ammonia or a mono or dialkyl methyl or ethyl amine fed at a rate in excess of the rate of reaction thereof, the excess of (2) being removed from the system during the reaction to remove from the system the lower alcohol component released from the ester in the reaction.

3,932,477

CYCLOOCTATETRAENE COMPLEXES OF NIOBIUM AND TANTALUM

Richard Royce Schrock, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 13, 1974, Ser. No. 478,966
Int. Cl.² C07F 9/00
U.S. Cl. 260—429 CY 18 Claims

1. A cyclooctatetraene complex having the formula: $Q^+M(C_8H_8)_3^-$, $RM(C_8H_8)_2$, or $(CH_3)_3Ta(C_8H_8)$, wherein M is tantalum or niobium,

R is Cl, Br, alkyl of 1 to 8 carbons or aryl of 6 to 12 carbons,

Q^+ is one equivalent of an alkali metal ion, an alkaline earth metal ion, $R'R''_3N^+$, R''_4P^+, or R''_4As^+, wherein R′ is alkyl of 1 to 8 carbons and R″ is alkyl of 1 to 8 carbons or aryl of 6 to 12 carbons.

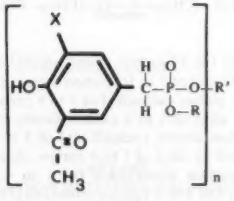
3,932,478

PHOSPHONIC ACID HALF-ESTERS AND THEIR DERIVATIVES

Joseph G. E. Fenyes, and Kenneth J. Flanagan, both of Memphis, Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

Division of Ser. No. 168,744, Aug. 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 127,776, March 24, 1971, Pat. No. 3,767,735. This application Oct. 3, 1973, Ser. No. 399,023
Int. Cl.² C07F 7/22
U.S. Cl. 260—429.7 9 Claims

1. A compound having the formula



wherein R is a straight or branched chain unsubstituted or substituted alkyl group containing 1 to 18 carbon atoms wherein the substituent group is a halogen, R′ is a metal selected from the group consisting of Al, Ni, Sn, and Zn, n is 2 or 3, and X is bromine or hydrogen.

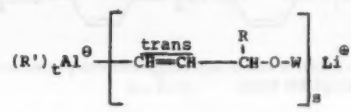
3,932,479

LITHIUM 3-TRIPHENYLMETHOXY-1-TRANS-ALKENYL-DIALKYL ALANATES

Karel Francis Bernady; Middleton Brawner Floyd, Jr., both of Suffern; John Frank Poletto, Nanuet, all of N.Y.; Robert Eugene Schaub, Upper Saddle River, and Martin Joseph Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 27, 1973, Ser. No. 355,350
Int. Cl.² C07F 5/06
U.S. Cl. 260—448 A 9 Claims

1. Compounds of the formula:



wherein R′ is an alkyl group having from 1 to 10 carbon atoms which may be different when t is greater than one; R is selected from the group consisting of a straight chain alkyl group having from 2 to 10 carbon atoms, a straight chain alkyl group having from 2 to 10 carbon atoms and substituted with one or two alkyl groups having from one to three carbon atoms, a straight chain alkenylmethyl group having from 3 to 10 carbon atoms and a straight chain alkenylmethyl group having from 3 to 10 carbon atoms and substituted with one or two alkyl groups having between them 2 to 5 carbon atoms; W is selected from a group consisting of lower alkyl, triphenylmethyl, triphenylmethyl in which one or two of the phenyl rings is substituted with a lower alkoxy group, tetrahydropyranyl, α-(lower alkoxy) substituted lower alkyl and tri(lower alkyl)silyl; s is an integer having the value of one to three, inclusive, and *t* is an integer having the values of one to three, inclusive, with the proviso that the sum of *s* and *t* must be equal to four.

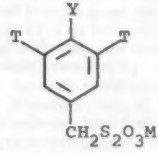
3,932,480

BENZYLTHIOSULFURIC ACID SALTS

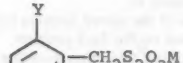
J. Michael Grasshoff, Hudson, and Lloyd D. Taylor, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 230,064, Feb. 28, 1972, abandoned, which is a division of Ser. No. 99,310, Dec. 17, 1970, Pat. No. 3,698,898. This application May 3, 1974, Ser. No. 466,630
Int. Cl.² C07C 161/05
U.S. Cl. 260—453 R 4 Claims

1. A compound having the formula:



or



wherein Y is hydroxyl or acetoxy; both T's are the same and represent hydrogen, chloro, or lower alkyl; and M is sodium or potassium.

3,932,481
SULFURIC ACID ESTERS OF BIS-(4-HYDROXYPHENYL)-METHANE

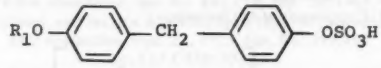
Mario G. Buzzolini, Convent Station, and Robert E. Manning, Mountain Lakes, both of N.J., assignors to Shandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 258,787, June 1, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 459,013

Int. Cl.² C07C *141/18*

U.S. Cl. 260—457 **2 Claims**

1. A compound of the formula



where

R_1 is SO_3H, or salts of said compound with pharmaceutically acceptable bases.

3,932,482
POLYHYDRO-2-PHENANTHRYLIDENEACETIC ACIDS AND ESTERS THEREOF

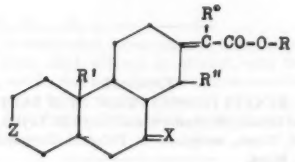
Philip E. Shaw, Winter Haven, Fla.; Sol J. Daum, Albany, and Robert L. Clarke, Bethlehem, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 879,921, Nov. 25, 1969, which is a continuation-in-part of Ser. No. 585,762, Oct. 11, 1966, Pat. No. 3,592,838. This application Jan. 5, 1971, Ser. No. 104,158

Int. Cl.² C07C *61/38, 64/74*

U.S. Cl. 260—468.5 **10 Claims**

1. A. A compound of the formula



wherein:

R is hydrogen or lower-alkyl;

R′ is hydrogen or lower-alkyl;

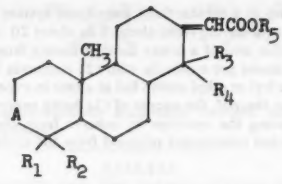
R″ and R^e are hydrogen or lower-alkyl;

X is H_2, and

Z is O=C, (HO)CH, (acyl-O)CH, or (lower-alkyl)C(OH), acyl, each instance being selected from the group consisting of lower-alkanoyl of up to 12 carbon atoms, cycloalkyl-lower-alkanoyl wherein cycloalkyl has 5–6 ring members, benzoyl, phenyl-lower-alkanoyl, phenyl-lower-alkenoyl, phenoxy-lower-alkanoyl, carbamyl, N-lower-alkylcarbamyl, N-phenylcarbamyl, N,N-di-lower-alkylcarbamyl, alkylcarbamyl, nicotinoyl and isonicotinoyl, and wherein the phenyl group of any of the acyls can be unsubstituted or substituted by lower-alkyl, lower-alkoxy, halogen or nitro; or

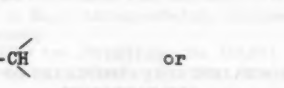
B. a compound of the above formula having a double bond in the 8,8a-position or the 8a,9-position.

7. A mixture of the two corresponding geometric isomers chosen from compounds of formula:

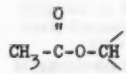


wherein R_1 and R_2 are both hydrogen or both methyl, R_3 is hydrogen or methyl, R_4 is hydrogen, and R′$_5$ is alkyl of 1 to 4 carbon atoms.

10. A mixture of two corresponding geometric isomers chosen from compounds of formula:



in which A is



or

R_1 and R_2 are both hydrogen or both methyl, R_3 is hydrogen or methyl, R_4 is hydrogen, and R_5 is alkyl having 1 to 4 carbon atoms.

3,932,483
W-ALIPHATIC AND CYCLOALIPHATIC-HYDROCARBONOXY-2,6-ALKADIENE AND 2-ALKENE-1-NITRILES

Hans-Peter Schelling, Oberwil, and Fritz Schaub, Basel, both of Switzerland, assignors to Sandoz, Ltd., Basel, Switzerland

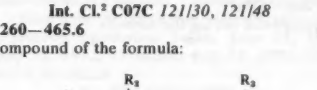
Continuation-in-part of Ser. No. 257,671, May 30, 1972, abandoned. This application Dec. 19, 1973, Ser. No. 426,428

Claims priority, application Switzerland, June 2, 1971, 8036/71

Int. Cl.² C07C *121/30, 121/48*

U.S. Cl. 260—465.6 **4 Claims**

1. A compound of the formula:



wherein

R_1 is alkyl of 1 to 10 carbon atoms; alkenyl of 3 to 10 carbon atoms; alkynyl of 3 to 10 carbon atoms; cycloalkyl of 3 to 6 carbon atoms; cycloalkyl of 3 to 6 carbon atoms substituted by alkyl of 1 to 4 carbon atoms; cycloalkenyl of 5 to 7 carbon atoms; cycloalkenyl of 5 to 7 carbon atoms substituted by alkyl of 1 to 4 carbon atoms; cycloalkyl(of 3 to 6 carbon atoms)alkyl (of 1 to 4 carbon atoms); cycloalkyl(of 3 to 6 carbon atoms)alkyl (of 1 to 4 carbon atoms) ring substituted by alkyl of 1 to 4 carbon atoms; cycloalkenyl(of 5 to 7 carbon atoms)alkyl (of 1 to 4 carbon atoms); or cycloalkenyl(of 5 to 7 carbon atoms-)alkyl(of 1 to 4 carbon atoms) ring substituted by alkyl of 1 to 4 carbon atoms;

R_2 and R_3, which are the same or different, are each hydrogen or alkyl of 1 to 4 carbon atoms,

Q is oxygen or sulphur;

$-Z_1-Z_2-$ is $-\overset{|}{C}H-CH_2-$ or $-\overset{|}{C}=CH-$;

and

n is an integer 1, 2 or 3.

3,932,484
PREPARATION OF MONOCARBOXYLATED CYCLODODECA DERIVATIVES

John F. Knifton, Poughquag, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Apr. 22, 1974, Ser. No. 462,832
Int. Cl.² C07C *67/38*
U.S. Cl. 260—468 R **4 Claims**

1. A process for preparing monoalkyl cyclododecanecarboxylates, said monoalkyl radicals being selected from the group consisting of methyl and ethyl, from 1,5,9-cyclododecatriene, by the process of:

a. contacting each molar equivalent of 1,5,9-cyclododecatriene present with from about 0.005 to 0.02 molar equivalents of $PtCl_2[As(C_6H_5)_3]_2$-$SnCl_2$ and at least one molar equivalent of an alkanol selected from the group consisting of methanol and ethanol, in an oxygen-free inert solvent, in the presence of a pressurized carbon monoxide atmosphere of from about 2000 psig to 4000 psig, to form a pressurized carboxylation mixture,

b. heating said pressurized carboxylation mixture between about 60° to 90°C, until substantial monocarboxylation of said triene takes place, and monoalkyl cyclododecadienecarboxylate is prepared,

c. removing the carbon monoxide from the carboxylation mixture containing the monoalkyl cyclododecadienecarboxylate, and contacting each molar equivalent of said cyclododecadienecarboxylate present, in an oxygen-free inert solvent environment with about 0.005 to 0.02 molar equivalents of $PtCl_2[As(C_6H_5)_3]_2$-$SnCl_2$, under a pressurized hydrogen atmosphere ranging from about 500 psig to 2000 psig to form a pressurized hydrogenation mixture,

d. heating said pressurized hydrogenation mixture between about 60° and 90°C, until substantial hydrogenation to the monoalkyl cyclododecanecarboxylate ester takes place, and

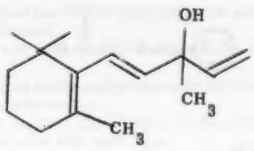
e. isolating the monoalkyl cyclododecanecarboxylate ester contained therein.

3,932,485
PREPARATION OF WITTIG SALT OF VINYL β-IONOL

Joseph Donald Surmatis, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 28, 1974, Ser. No. 501,127
Int. Cl.² C07C *67/00*
U.S. Cl. 260—468 L **6 Claims**

1. A process for preparing a phosphonium salt comprising reacting an alpha, beta-unsaturated alcohol of the formula:



with a phosphine of the formula:

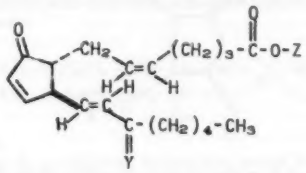
wherein R_1 is alkyl of from 1 to 12 carbon atoms, phenyl, phenyl lower alkyl or di(lower alkyl) amino wherein lower alkyl contains from 1 to 6 carbon atoms; and R_2 and R_3 are lower alkyl, phenyl, phenyl lower alkyl or di (lower alkyl) amino wherein lower alkyl contains from 1 to 6 carbon atoms in a basic medium and in the presence of a salt of a weak organic base with a strong acid.

3,932,486
SUBSTITUTED TOLYL ESTERS OF PGA_2

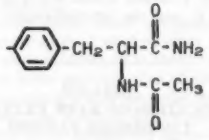
Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

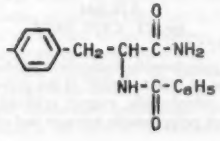
Division of Ser. No. 431,598, Jan. 8, 1974. This application Dec. 12, 1974, Ser. No. 531,992
Int. Cl.² C07C *133/08, 103/82*
U.S. Cl. 260—468 D **11 Claims**

1. An optically active compound of the formula:

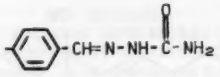


or a racemic compound of that formula and the mirror image thereof, wherein Z is

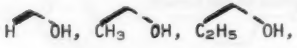


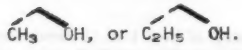


or



and wherein Y is





3,932,487

13-SULFA-PROSTAGLANDINS

Josef Kramer; Hans Radunz; Dieter Orth; Manfred Baumgarth, and Jurgen Harting, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

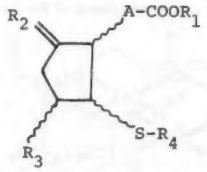
Filed Nov. 15, 1973, Ser. No. 416,183

Claims priority, application Germany, Nov. 17, 1972, 2256537

Int. Cl.² C07C *149/26, 149/40*

U.S. Cl. 260—468 D **19 Claims**

1. Compounds of the formula



wherein R_1 is H or alkyl of up to 12 carbon atoms; R_2 is =O, (H,OH) or (H,acyloxy) wherein acyloxy is alkanoyloxy or alkanesulfonyloxy each of up to 4 carbon atoms; R_3 is H, OH or acyloxy as defined above; R_4 is alkyl, fluoroalkyl, 2-hydroxyalkyl or 2-acyloxyalkyl wherein acyloxy is as defined above, each alkyl being of 2 of 12 carbon atoms which is unsubstituted or substituted by phenyl of p-tolyl; and A is alkylene of 4 to 8 carbon atoms which is unsubstituted or substituted by F, and the physiologically acceptable salts thereof.

3,932,488

ETHERIFICATION OF BARK EXTRACTS AND CONDENSED TANNINS

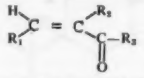
Karl David Sears, Shelton, Wash., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 282,333, Aug. 21, 1972, Pat. No. 3,856,845. This application Nov. 1, 1974, Ser. No. 520,044

Int. Cl.² C07C *69/76*

U.S. Cl. 260—473.5 **12 Claims**

1. Etherified polyphenolic derivatives produced by reacting at a temperature of 110° to 260°C in the presence of an alkaline catalyst a polyphenolic extract selected from the class consisting of bark polyphenolic extracts and condensed tannin wood extracts with (a) an olefin of the formula



in which R_1 and R_2 are the same or different and are selected from the group consisting of H, 1 to 3 carbon alkyl, COOH, COOM, COR_4 and $COOR_4$ in which M is an alkali metal and R_4 is a 1 to 3 carbon alkyl and R_3 is selected from the group consisting of H, 1 to 3 carbon alkyl, OH, OM and OR_4 or (b) an anhydride of the foregoing olefin; the mole/mole ratios of olefin reactant to monomeric unit in the polyphenolics ranging from about 1:1 to 10:1.

3,932,489

PROCESS FOR T-BUTYLATING HYDROXY- OR THIOL-UBSTITUTED AMINO ACIDS

Edward L. Smithwick, Jr., Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 196,182, Nov. 5, 1971, abandoned. This application Nov. 16, 1973, Ser. No. 416,703

Int. Cl.² C07C *125/06*

U.S. Cl. 260—482 C **8 Claims**

1. A process for t-butylating a hydroxy or thiol amino acid, which comprises reacting a hydroxy or thiol amino acid, an ester thereof, or an N-protected derivative thereof, with isobutylene in the presence of a catalyst consisting essentially of boron trifluoride and anhydrous phosphoric acid.

3,932,490

DOXYCYCLINE ACETURATE

Piedad Amezua Fernandez, Avenida del Poblado s/n - Edificio Montefresno escalera A, 1° derecha, Puerta Hierro, Madrid, Spain

Filed Dec. 4, 1972, Ser. No. 312,035

Claims priority, application Spain, Dec. 4, 1971, 397675

Int. Cl.² C07C *103/19*

U.S. Cl. 260—501.11 **1 Claim**

1. Doxycycline aceturate.

3,932,491

PROCESS FOR OPTICAL RESOLUTION OF RACEMIC LYSINE SULPHANILATE

Geertrudes H. Suverkropp, Geleen, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Apr. 8, 1974, Ser. No. 459,237

Claims priority, application Netherlands, May 7, 1973, 7306318

Int. Cl.² C07C *143/58*

U.S. Cl. 260—501.12 **3 Claims**

1. In a process for resolving DL-lysine sulphanilate comprising the steps of preparing a supersaturated solution of DL-lysine sulphanilate in water, seeding the supersaturated solution with crystals of the desired enantiomer of the DL-lysine sulphanilate to cause crystallization of the desired enantiomer to take place, and recovering the separated crystals,

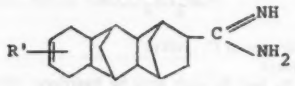
the improvement comprising during the preparation of the supersaturated solution and prior to seeding adding a compound selected from the group consisting of DL-lysine, DL-lysine acetate, DL-lysine carbonate, amino acetic acid and glycerol, present in an amount of from about 0.01 to about 2 g. per gram of dissolved lysine sulphanilate contained in the supersaturated starting solution, which compound suppresses crystallization of racemic lysine sulphanilate during the crystallization of the desired enantiomer.

3,932,492
PROCESS FOR PREPARING NEW AMIDINE COMPOUNDS

Yoshiaki Inamoto, and Koji Aigami, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1974, Ser. No. 521,855
Claims priority, application Japan, Nov. 14, 1973, 48-127930
Int. Cl.² C07C *123/00*
U.S. Cl. 260—501.14 2 Claims

1. An amidine compound having the formula



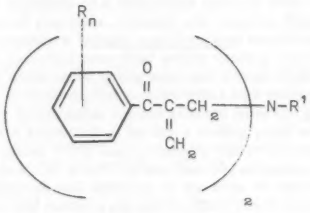
wherein R' is H or CH_3, or an antimicrobially effective acid addition salt thereof.

3,932,493
3,3-(ALKYLIMINO)BIS(2-METHYLENEPROPIOPHENONE)MICROBIOCIDES

William W. Turner, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 9, 1975, Ser. No. 539,670
Int. Cl.² C07C *97/10*
U.S. Cl. 260—501.18 7 Claims

1. A compound of the formula



wherein:
n represents 0 to 3;
R represents
C_1–C_3 alkyl,
C_1–C_3 alkoxy,
fluoro, or
phenyl;
provided that when R represents phenyl, *n* represents 1; R^1 represents C_1–C_2 alkyl; and the nonphytotoxic acid addition salts thereof.

3,932,494
THIOHUMIC ACID, A PROCESS FOR PREPARING SAME, AND ITS USE FOR ABSORBING HEAVY METAL IONS

Hisayoshi Yoshida; Takato Nakamura; Masanao Nakagawa; Seiji Arita, and Toshiharu Miki, all of Tosu, Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Dec. 20, 1973, Ser. No. 426,561
Claims priority, application Japan, Dec. 21, 1972, 47-128610
Int. Cl.² C07C *153/00*
U.S. Cl. 260—502.6 2 Claims

1. A thiocarboxyl derivative of humic acid prepared by (1) reacting:

a. regenerated humic acid prepared by the oxidation of coal with nitric acid,
b. humic acid prepared by the extraction of lignite with alkali,
c. regenerated humic acid prepared by the oxidation of coal tar pitch with air, or
d. granular oxidized coal obtained by the oxidation of granular semi-coke with nitric acid,

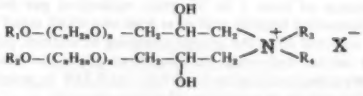
with a halogenating agent of the group consisting of thionyl chloride, thionyl bromide, phosphorus trichloride, phosphorus pentachloride and phosphorus oxychloride at a temperature ranging from room temperature to the boiling point of said halogenating agent; and (2) reacting the resultant acid halide with a thiolating agent of the group consisting of hydrogen sulfide or alkali metal hydrosulfide to produce the thiocarboxyl derivative containing about 2–6 meq/g of thiocarboxyl groups.

3,932,495
PROCESS FOR PREPARING QUATERNARY AMMONIUM COMPOUNDS

Eva Margareta Martinsson, Stenungsund, and Karl Martin Edvin Hellsten, Odsmal, both of Sweden, assignors to Modokemi Aktiebolag, Stenungsund, Sweden

Continuation-in-part of Ser. Nos. 306,251, Nov. 10, 1972, abandoned, and Ser. No. 423,592, Dec. 10, 1973. This application Aug. 27, 1974, Ser. No. 501,115
Claims priority, application Sweden, Nov. 19, 1971, 14793/71; Oct. 11, 1972, 13069/72
Int. Cl.² C07C *85/06*
U.S. Cl. 260—567.6 M 10 Claims

1. A process for the preparation of alkoxyalkylene oxy(2-hydroxy)propylene quaternary ammonium compounds having the formula:



in which
R_1 and R_2 are aliphatic hydrocarbon groups having from about eight to about twenty-two carbon atoms.
R_3 and R_4 are selected from the group consisting of methyl, ethyl and hydroxyethyl.
n is a number from 2 to 4, representing the number of carbon atoms in the oxyalkylene substituent,
n_1 and n_2 are numbers within the range from 0 to about 10, representing the number of oxyalkylene groups present in each substituent; and
X is a salt-forming anion; which comprises reacting from zero to about ten mols of alkylene oxide with one mol of an aliphatic alcohol having from about eight to about 22 carbon atoms, in the presence of an alkaline catalyst at an elevated temperature within the range from about 25° to 150°C, reacting the resulting alkoxy glycol ether or aliphatic alcohol, if no oxyalkylene group is present, with epichlorohydrin, producing the corresponding chloroglyceryl or chlorohydroxypropylene ether, and then reacting this ether with a secondary amine having the formula R_3R_4NH, where R_3 and R_4 are selected from the group consisting of methyl, ethyl and hydroxyethyl in the presence of alkali and in the presence of a solvent selected from the group consisting of water and inert water-miscible organic solvents at an elevated temperature within the range from about 25° to 150°C, until there is obtained the quaternary ammonium compound of the above formula in the form of its chloride salt.

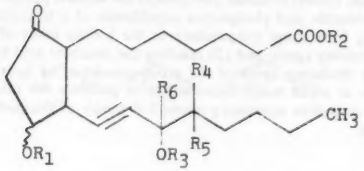
3,932,496

MONO- AND DIALKYLATED PROSTYNOIC ACID DERIVATIVES

Christopher Jung, Morton Grove, and Raphael Pappo, Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Apr. 23, 1973, Ser. No. 353,216
Int. Cl.² C07C *61/38, 61/74*
U.S. Cl. 260—514 D **7 Claims**

1. A compound of the formula



wherein R_1 and R_3 are hydrogen or a lower alkanoyl radical, R_2 and R_6 are hydrogen or a lower alkyl radical, R_4 and R_5 are lower alkyl radicals and the wavy line indicates the alternative R and S stereochemical configuration.

3,932,497

PROCESS FOR PREPARING 4-AMINOMETHYL CYCLOHEXANE CARBOXYLIC ACID-1

Hirokazu Fukumi, Ooi; Koryo Itoh; Yutaka Usubuchi, both of Tokyo, and Hirataka Itoh, Fujimi, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 19, 1973, Ser. No. 398,598
Claims priority, application Japan, Oct. 2, 1972, 47-98020
Int. Cl.² C07C *51/36*
U.S. Cl. 260—514 J **5 Claims**

1. A process for the catalytic hydrogenation of p-aminomethyl benzoic acid to form 4-aminomethyl cyclohexane carboxylic acid-1 utilizing a ruthenium metal catalyst which is characterized by effecting the reaction in an aqueous medium at a hydrogen pressure of 50 to 200 kg/cm² in the presence of from 1 to 35 gram equivalent per mol of p-aminomethyl benzoic acid of at least one alkali metal hydroxide selected from the group consisting of sodium, potassium and calcium hydroxide, the amount of ruthenium metal in the catalyst employed being from 0.025 to 0.25% by weight based on the weight of p-aminomethyl benzoic acid.

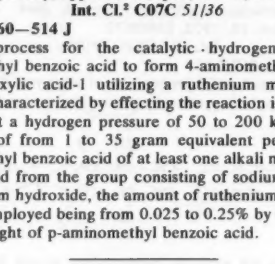
3,932,498

3-INDENYL-γ-(KETOBUTYRIC)-ACID COMPOUNDS

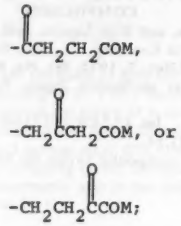
Tsung-Ying Shen, Westfield; Howard Jones, Holmdel, and Michael W. Fordice, Cranford, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 108,628, Jan. 21, 1971, abandoned. This application Feb. 23, 1973, Ser. No. 335,220
Int. Cl.² C07C *149/28, 147/107, 147/14*
U.S. Cl. 260—515 A **7 Claims**

1. A compound of the formula



wherein
R_1 is



R_2 is hydrogen or $C_{1\text{-}15}$ alkyl;
Ar is phenyl;
R_3, R_4, R_5 and R_6 each may be hydrogen, nitro, amino, sulfamyl, mercapto, hydroxy, halogen, cyano, carboxyl, carbamido, $C_{1\text{-}5}$ alkyl, $C_{1\text{-}5}$ alkoxy, $C_{1\text{-}5}$ alkanoyl, $C_{1\text{-}4}$ alkenyloxy, $C_{1\text{-}5}$ alkanoyloxy, dimethylamino or ethynyl;
R_7 is $C_{1\text{-}5}$-alkylsulfinyl, $C_{1\text{-}5}$ alkylsulfonyl or methylthio;
R_8 is hydrogen, halogen, hydroxy, $C_{1\text{-}5}$ alkoxy or $C_{1\text{-}5}$ haloalkoxy; and
M is hydroxy, $C_{1\text{-}5}$ alkoxy, $C_{1\text{-}5}$ alkanoyloxy-$C_{1\text{-}5}$ alkoxy or OMe in which Me is a cation of a pharmaceutically acceptable salt; provided that at least one of R_3, R_4, R_5 and R_6 is not hydrogen.

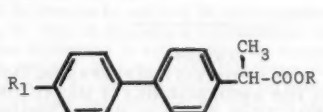
3,932,499

2-(SUBSTITUTED BIPHENYLYL) PROPIONIC ACIDS

Stewart Sanders Adams; Bernard John Armitage, and John Stuart Nicholson, all of Nittingham, England, assignors to The Boots Company Limited, Nottingham, England

Filed Sept. 22, 1971, Ser. No. 182,857
Claims priority, application United Kingdom, Oct. 12, 1970, 48405/70
Int. Cl.² C07C *63/52*
U.S. Cl. 260—515 A **9 Claims**

1. A compound of formula I



. . . I

in which
R_1 is fluorine or bromine;
one of R_2 and R_3 is fluorine or bromine and
the other is hydrogen;
and R is hydrogen or lower alkyl; (together with) or a pharmaceutically acceptable inorganic and organic salt(s) of said compound(s) when R is hydrogen.

3,932,500
RECOVERING ANHYDROUS ACRYLIC ACID

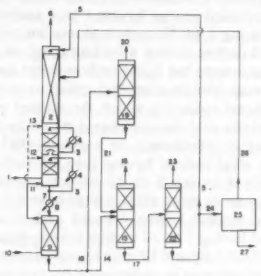
Gerd Duembgen, Dannstadt; Heinz Engelbach, Limburgerhof; Walter Frey, Mannheim; Richard Krabetz, Kirchheim; Ulrich Lebert, Ludwigshafen; Hermann Spitzl, Ludwigshafen; Fritz Thiessen, Ludwigshafen, and Carl-Heinz Willersinn, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 17, 1972, Ser. No. 272,551

Claims priority, application Germany, July 21, 1971, 2136396

Int. Cl.² C07C *53/00, 55/00, 57/00, 59/00*

U.S. Cl. 260—526 N 6 Claims



1. A continuous process for recovering anhydrous acrylic acid from a reaction gas which has been obtained by the catalytic oxidation of a compound selected from the group consisting of propylene, acrolein and mixtures thereof which process comprises: initially scrubbing said reaction gas which contains unreacted propylene and/or acrolein and impurities including water vapor, acetic acid, and formaldehyde countercurrently in an absorption column with a high boiling inert and extremely hydrophobic solvent selected from the group consisting of a hydrocarbon having a boiling point at standard pressure above 170°C and a viscosity within the temperature range of from 30° to 80°C of less than 10 centistokes, diphenyl ether, diphenyl and mixtures of the same to absorb acrylic acid from said reaction gas and to effect direct cooling of the reaction gas with said solvent; and thereafter recovering acrylic acid from said solvent by distillation and recycling said solvent to said absorption column.

3,932,501
PROCESS FOR RECOVERING BETA-ALANINE FROM SODIUM CHLORIDE SOLUTIONS

Jon Carl Thunberg, Amherst, N.H.; Robert Wright Bragdon, Marblehead, Mass., and William Philip Moore, Hudson, N.H., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 517,469, Oct. 24, 1974, which is a continuation-in-part of Ser. No. 442,543, Feb. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 319,539, Dec. 29, 1972, Pat. No. 3,808,269. This application Mar. 25, 1975, Ser. No. 561,924

Int. Cl.² C07C *99/12*

U.S. Cl. 260—534 C 9 Claims

1. A process for recovering β-alanine from an aqueous starting solution consisting essentially of water, β-alanine, and sodium chloride, the aqueous starting solution having a temperature above 0°C, a pH of 4.5–8.5, and a mole ratio of β-alanine to sodium chloride of 0.7–5:1, the process comprising:

a. forming a first slurry consisting essentially of a first lot of precipitated solid sodium chloride and a first mother liquor consisting essentially of water, dissolved β-alanine, and dissolved sodium chloride by evaporating water from the aqueous starting solution;

b. separating the first mother liquor from the first lot of precipitated solid sodium chloride at a temperature effective for preventing the precipitation of solid β-alanine;

c. forming a second slurry consisting essentially of a first lot of precipitated solid β-alanine and a second mother liquor consisting essentially of water, dissolved β-alanine, and dissolved sodium chloride by adjusting the temperature of the separated first mother liquor to a temperature effective for precipitating β-alanine; and

d. separating the second mother liquor from the first lot of precipitated solid β-alanine while maintaining the temperature of the second slurry within a temperature range effective for precipitating β-alanine, and recovering the separated β-alanine.

3,932,502
PROCESS FOR THE MANUFACTURE OF PHOSPHORUS-CONTAINING CONDENSATION PRODUCTS, THE PRODUCTS AND THEIR USE AS FLAMEPROOFING AGENTS

Hermann Nachbur, Dornach, and Arthur Maeder, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 31, 1972, Ser. No. 285,172

Claims priority, application Switzerland, Jan. 14, 1972, 518/72

Int. Cl.² C07C *127/24*

U.S. Cl. 260—553 B 12 Claims

1. A process for the manufacture of a water-soluble condensation product of a hydroxymethyl-phosphonium compound and biuret, wherein 1 mol of a tetrakis-(hydroxymethyl)-phosphonium halide or tetrakis-(hydroxymethyl)-phosphonium hydroxide is mixed and heated at 40°C to 120°C with 0.02 to 0.5 mols of biuret.

3,932,503
BENZENESULFONYL UREAS

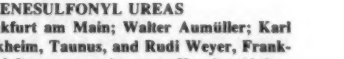
Helmut Weber, Frankfurt am Main; Walter Aumüller; Karl Muth, both of Kelkheim, Taunus, and Rudi Weyer, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 641,146, May 25, 1967, abandoned, and a continuation-in-part of Ser. No. 749,609, Aug. 2, 1968, abandoned, and a continuation-in-part of Ser. No. 10,659, Feb. 11, 1970, abandoned. This application May 25, 1970, Ser. No. 41,160

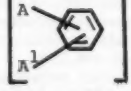
Int. Cl.² C07C *127/16*

U.S. Cl. 260—553 DA 9 Claims

1. Benzenesulfonyl- ureas corresponding to the formula



wherein R^1 is lower alkyl-cyclopentyl, X is



phenyl which is substituted in the 2-position by methoxy and in 5-position by halogen, methyl or methoxy,

Y is a saturated hydrocarbon chain of 1-3 carbon atoms, or a salt thereof of pharmaceutically acceptable bases.

3,932,504
UREA MANUFACTURE

Larry P. Chen, and Theodore O. Wentworth, both of Cincinnati, Ohio, assignors to Vulcan-Cincinnati, Inc., Cincinnati, Ohio

Filed May 19, 1970, Ser. No. 38,686
Int. Cl.² C07C *126/00*
U.S. Cl. 260—555 A **4 Claims**

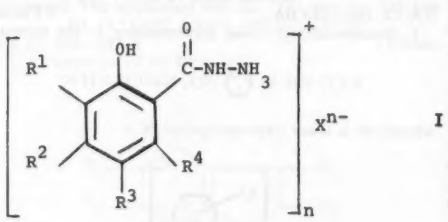
1. In a process for making urea from ammonia and carbon dioxide wherein gaseous ammonia is introduced into a stripping zone for upward flow therein into a reaction zone maintained at substantially the same pressure as the stripping zone, wherein carbon dioxide is introduced into the lower portion of the reaction zone for admixture with ammonia from the stripping zone, wherein the carbon dioxide and ammonia are flowed upwardly in the reaction zone and countercurrently to an aqueous stream containing ammonium carbamate and urea, wherein the carbon dioxide and ammonia are reacted in the reaction zone to form ammonium carbamate, urea and water, wherein the amount of ammonia introduced into the reaction zone is in excess of that stoichiometrically required to react with the carbon dioxide introduced into the reaction zone in producing urea, wherein said aqueous stream containing ammonium carbamate and urea is passed downwardly through the stripping zone countercurrently to the gaseous ammonia introduced thereinto to decompose the carbamate to carbon dioxide and ammonia for passage with the carbon dioxide fed into the reaction zone, and wherein said reaction zone is cooled by means of indirect heat exchange, the improvement which comprises passing liquid ammonia into indirect heat exchange with the reactants in said reaction zone whereby liquid ammonia is made gaseous and introducing gaseous ammonia thus formed into said stripping zone.

3,932,505
HYDRAZIDE SALTS

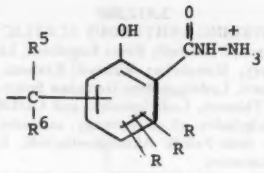
Wilfred Pickles, and Eric Keith Baylis, both of Stockport, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 4, 1974, Ser. No. 430,843
Claims priority, application United Kingdom, Jan. 6, 1973, 908/73; May 9, 1973, 22108/73
Int. Cl.² C07C *103/26*
U.S. Cl. 260—559 H **11 Claims**

1. A compound having the formula I



in which R^1, R^2, R^3, and R^4 may be the same or different and each represent hydrogen; a straight or branched chain alkyl radical having 1 to 20 carbon atoms; an aralkyl radical having 7 to 20 carbon atoms which may be substituted by one or more alkyl groups having 1 to 4 carbon atoms; or may be



wherein R^5 and R^6 are each a hydrogen atom or a methyl group, and each R represents the others of R^1, R^2, R^3 and R^4; an alkenyl radical having 2 to 20 carbon atoms; a cycloalkyl radical having 5 to 12 carbon atoms which may be substituted by one or more alkyl groups having 1 to 4 carbon atoms; an aryl radical having 6 to 10 carbon atoms; an alkaryl radical having 7 to 12 carbon atoms; a cyclohexenyl alkyl radical in which the alkyl moiety has 2 or 3 carbon atoms and the cyclohexenyl ring may contain a methyl group as substituent; an alkenyl cyclohexyl radical in which the alkenyl moiety has 2 or 3 carbon atoms and the cyclohexyl ring may also contain a methyl group as substituent; or a group $-OR^7$ wherein R^7 represents an alkyl radical having 1 to 20 carbon atoms, a cycloalkyl radical having 5 to 12 carbon atoms, optionally substituted by one or more alkyl groups having 1 to 4 carbon atoms, an aryl radical having 6 to 10 carbon atoms or an alkenyl radical having 3 to 20 carbon atoms; or any two adjacent radicals R^1, R^2, R^3 and R^4 may be joined together to form an aryl ring which may be substituted by one or more alkyl groups having 1 to 20 carbon atoms; and with the proviso that the total number of carbon atoms of R^1, R^2, R^3 and R^4 are more than 8; X represents an anion; and n is the valency of X.

3,932,506
RANEY COPPER CATALYST PRODUCTION AND USE

Wood Eugene Hunter, Lombard, and Karl H. Hoffman, Brookfield, both of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Filed Aug. 8, 1974, Ser. No. 495,567
Int. Cl.² C07C *103/08*
U.S. Cl. 260—561 N **21 Claims**

1. In an improved process for preparing a Raney copper type catalyst, the steps comprising contacting at a temperature below about 80°C particles of an alloy comprised of an alloy comprised of aluminum and copper in a weight ratio of from about 70:30 to 30:70, said particles ranging in size from about 0.001 to 0.5 inch with an aqueous solution having dissolved therein from greater than 0 up to about 25 weight percent of at least one material selected from the group consisting of amine bases, ammonia, and alkali metal hydroxide for a time sufficient to remove from said particles at least about 25 weight percent of the aluminum present therein on a total initial particle weight basis, and further contacting such particles simultaneously and/or sequentially during said contacting with an aqueous solution having dissolved therein from greater than 0 up to about 25 weight percent of at least one polyfunctional oxygen-containing aromatic compound, for a time of at least about ½ hour, each said amine base being selected from the group consisting of alkyl amines, alkanol amines, and quaternary ammonium hydroxides, each said polyfunctional oxygen-containing aromatic compound being characterized by

A. containing per molecule
   1. at least one six membered aromatic nucleus,
   2. at least two oxygen atoms, each such oxygen atom being incorporated into a different radical selected from the class consisting of hydroxyl groups and carboxyl groups,
   3. at least one of said radicals being substituted on said one aromatic nucleus, and

4. not more than three repeating, condensed units per molecule,

B. having a solubility in water at a pH greater than 10 to an extent such that about a 5 weight percent solution thereof can be formed at room temperature conditions, and

C. having a molecular weight of not more than about 1000.

19. A process for hydrolyzing an olefinic nitrile comprising the steps of

A. Contacting at a temperature below about 80°C particles of an alloy comprised of aluminum and copper in a weight ratio of from about 70:30 to 30:70, said particles ranging in size from about 0.001 to 0.5 inch, with an aqueous solution having dissolved therein from greater than 0 up to about 25 weight percent of at least one material selected from the group consisting of amine bases, ammonia, and alkali metal hydroxide for a time sufficient to remove from said particles at least about 25 weight percent of the aluminum present therein on a total initial particle weight basis, each said amine base being selected from the group consisting of alkyl amines, alkanol amines, and quaternary ammonium hydroxides,

B. Further contacting such particles simultaneously and/or sequentially during said contacting with an aqueous solution having dissolved therein from greater than 0 up to about 25 weight percent of at least one polyfunctional oxygen-containing aromatic compound for a time of at least about ½ hour, each said polyfunctional oxygen-containing aromatic compound being characterized by

1. containing per molecule

a. at least one six membered aromatic nucleus,

b. at least two oxygen atoms, each such oxygen atom being incorporated into a different radical selected from the class consisting of hydroxyl groups and carboxyl groups,

c. at least one of said radicals, being substituted on said one aromatic nucleus, and

d. not more than three repeating, condensed units per molecule,

2. having a solubility in water at a pH greater than 10 to an extent such that about a 5 weight percent solution thereof can be formed at room temperature conditions, and

3. having a molecular weight of not more than about 1000,

C. Still further contacting the so-washed particles with a composition comprising from about 10 to 75 weight percent acrylonitrile with the remainder up to one hundred weight percent thereof being water at a temperature ranging from about 150 to 300°F for a time sufficient to convert at least some of said olefinic nitrile to the corresponding amide.

3,932,507
PROCESS FOR THE CHLORINATION OF AROMATIC ISOCYANIDE DICHLORIDES

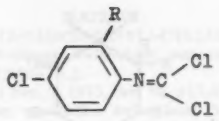
William Wayne Brand, Hopewell, and David William Reger, Trenton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 27, 1973, Ser. No. 355,119

Int. Cl.² C07C *119/00*

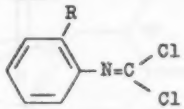
U.S. Cl. 260—566 D **10 Claims**

1. A method for the preparation of compounds having the formula:



wherein R represents alkyl C_1–C_8, including straight chain alkyl, branched chain alkyl and cycloalkyl comprising:

reacting an isomerically pure compound having the formula:



where R is as described above, with a chlorine source at a temperature between 20°C. and 150°C.

3,932,508
POLYFLUOROMETHYLTHIO-SUBSTITUTED COMPOUNDS

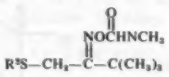
James R. Throckmorton, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 26, 1974, Ser. No. 464,493

Int. Cl.² C07C *131/00*

U.S. Cl. 260—566 AC **3 Claims**

1. A compound of the formula



wherein R^3 is CF_3— or CF_2H—.

3,932,509
CARBAMOYLOXIMES DERIVATIVES

Karl Gatzi, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 124,527, March 15, 1971, Pat. No. 3,843,724. This application June 26, 1974, Ser. No. 483,203

Claims priority, application Switzerland, Mar. 23, 1970, 4319/70

Int. Cl.² C07C *131/02*

U.S. Cl. 260—566 AC **6 Claims**

1. O-(1,4-Menthyl(3)-carbamoyl)-cyclopentanone oxime.

3,932,510
PROCESS FOR THE PREPARATION OF CYCLOHEXANEDIONES-(1,3)

Werner H. Müller, Kelkheim, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

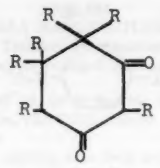
Filed Dec. 13, 1973, Ser. No. 424,308

Claims priority, application Germany, Dec. 16, 1972, 2261751

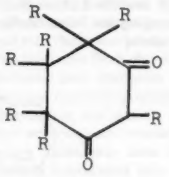
Int. Cl.² C07C *45/00*

U.S. Cl. 260—586 R **4 Claims**

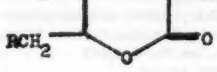
1. In a method for the preparation of 1,3-cyclohexanediones of the formulas



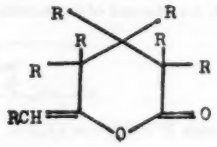
or



wherein the R's are the same or different and each represents hydrogen, alkyl, or aryl, by the isomerization, with a strong base, in the presence of a solvent, of, respectively, a δ-enol lactone having a cyclic or semi-cyclic double bond and having the formula



or



the improvement wherein said solvent comprises at least 50 percent of a member selected from the group consisting of dimethyl formamide, dimethyl acetamide, N-methyl-pyrrolidone, hexamethyl-phosphoric acid triamide, dimethyl sulfoxide, and sulfolane, the balance of said solvent being methanol, diethyl ether, acetonitrile, or benzene.

3,932,511
PREPARATION OF CYCLOHEXANE-1,3-DIONE AND OF ALKYL-SUBSTITUTED DERIVATIVES THEREOF

Sijbrandus E. Schaafsma, Beek; Johannes E. L. Claassens, Heerlen, and Egidius J. M. Verheijen, Sittard, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

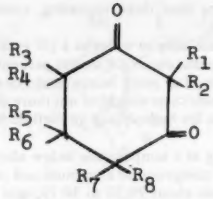
Filed Mar. 11, 1974, Ser. No. 450,220

Claims priority, application Netherlands, Mar. 14, 1973, 7303536

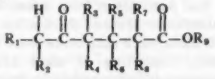
Int. Cl.² C07C *45/00*

U.S. Cl. 260—586 C **10 Claims**

1. A process for the preparation of a cyclohexane-1,3-dione of the formula



wherein R_1–R_8, which are the same or different, are each hydrogen or an alkyl group containing up to 6 carbon atoms and the total number of carbon atoms of R_1–R_8 is not more than 12 carbons which comprises contacting a delta-keto ester of the formula



wherein, R_1–R_8 are as defined above and R_9 is an alkyl, cycloalkyl, or monocyclic or bicyclic aryl or arylalkyl group containing up to 12 carbon atoms, in the gaseous state at a temperature from about 100°C to about 500°C with a thermally stable solid material which is active carbon, magnesium oxide, calcium oxide, barium oxide, strontium oxide or graphite and which has an internal surface area of from about 100 to 1,500 m^2/gm.

3,932,512
ANTIVIRAL 1,2,3,4-TETRAHYDRO-1,-ALKANO NAPHTHALENAMINE DERIVATIVES

Kekhusroo R. Bharucha, Toronto; Djordje Ajdukovic, Montreal; Vytautas Pavilanis, Westmount, and Angus Campbell Mackay, Toronto, all of Canada, assignors to Canada Packers Limited, Toronto, Canada

Filed Sept. 14, 1972, Ser. No. 289,122

Int. Cl.² C07C *87/29*

U.S. Cl. 260—570.9 **6 Claims**

1. A compound selected from the group consisting of 1,2,3,4-tetrahydro-1,4-methanonaphthalen-exo-3-dimethylaminomethyl-endo-2-amine and its pharmaceutically acceptable acid addition salts.

3,932,513
CYCLOHEXANE OXIDATION

Joseph L. Russell, Ridgewood, N.J., assignor to Halcon International, Inc., New York, N.Y.

Continuation of Ser. No. 113,081, Feb. 5, 1971, abandoned, which is a continuation of Ser. No. 650,996, July 3, 1967, abandoned. This application Feb. 22, 1973, Ser. No. 334,822

Int. Cl.² C07C *27/12*, *29/00*, *45/02*

U.S. Cl. 260—586 AB **4 Claims**

1. The process of oxidizing cyclohexane which comprises

contacting cyclohexane in the liquid phase at a temperature of from about 100° to 180°C with a molecular-oxygen containing gas in each of a series of separate and interconnected oxidation zones,

passing the liquid effluent from one zone to the next zone in series,

removing vapors from each oxidation zone respectively,

condensing said vapors to form a hydrocarbon phase and an aqueous phase,

separating said aqueous phase from said hydrocarbon phase,

returning the hydrocarbon phase in liquid form to the first of the series of oxidation zones,

removing a liquid effluent mainly containing unreacted cyclohexane and also containing oxidation products from the last of the series of oxidation zones,

subjecting said liquid effluent from said last zone to vaporization of contained cyclohexane prior to recovery of the oxidation product, and

returning directly to each of said oxidation zones a portion of said vaporized cyclohexane while in vaporized form.

3,932,514

CATALYST FOR THE PREPARATION OF CYCLOHEXANONE FROM PHENOL AND PROCESS THEREFOR

Hermann Thelen, Krefeld-Bockum; Kurt Halcour, Leverkusen; Wulf Schwerdtel, Cologne, and Wolfgang Swodenk, Odenthal-Globusch, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 180,150, Sept. 13, 1971, abandoned. This application Feb. 23, 1973, Ser. No. 335,216

Claims priority, application Germany, Sept. 17, 1970, 2045882

Int. Cl.² C07C *45/00*

U.S. Cl. 260—586 P 9 Claims

1. In a process for the preparation of cyclohexanone by the selective hydrogenation of phenol in the vapor phase, the improvement which comprises carrying out the hydrogenation in the presence of a palladium catalyst on an aluminum spinel carrier obtained by annealing alumina with compounds of monovalent or divalent spinel forming metals followed by impregnation of the thus formed spinel carrier with a palladium salt which is subsequently reduced to the metal, said catalyst containing 0.1 to 10% by weight palladium.

3,932,515

NOVEL OXYGENATED DERIVATIVES OF THUJOPSENE

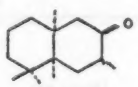
Gary W. Shaffer; Garry C. Kitchens, both of Wayne, and Kent Kaiser, Pequannock, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 49,950, June 25, 1970. This application Oct. 19, 1973, Ser. No. 408,126

Int. Cl.² C07C *49/36*

U.S. Cl. 260—586 F 1 Claim

1. A compound of the formula



3,932,516

NOVEL OXYGENATED DERIVATIVES OF THUJOPSENE

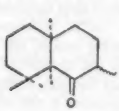
Gary W. Shaffer; Garry C. Kitchens, both of Wayne, and Kent Kaiser, Pequannock, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 49,950, June 25, 1970. This application Oct. 19, 1973, Ser. No. 408,127

Int. Cl.² C07C *49/36*

U.S. Cl. 260—586 F 1 Claim

1. A compound of the formula



3,932,517

ISOPROPYL-(3-OXOPENTENYL)-CYCLOPENTENES

Peter Naegeli, Wettingen, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

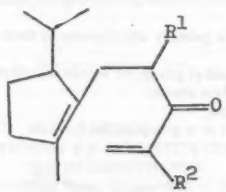
Filed Nov. 7, 1973, Ser. No. 413,470

Claims priority, application Switzerland, Nov. 15, 1972, 16605/72

Int. Cl.² C07C *49/61*

U.S. Cl. 260—586 R 5 Claims

1. Cyclopentene derivatives of the general formula



wherein R^1 and R^2 each independently represent a hydrogen atom or a lower alkyl group.

3,932,518

METHYLATION OF CYCLOHEXANONE WITH SIMULTANEOUS DEHYDROGENATION

Hans-Jürgen Arpe, Fischbach, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 21, 1973, Ser. No. 417,757

Claims priority, application Germany, Nov. 24, 1972, 2257675; May 24, 1973, 2326406

Int. Cl.² C07C *45/00*

U.S. Cl. 260—586 R 2 Claims

1. A process for methylating cyclohexanone in α-position to the carbonyl group with simultaneous dehydrogenation in the gaseous phase in the presence of a catalyst consisting essentially of metallic copper supported on a carrier which comprises reacting cyclohexanone with methanol at a temperature from above 250° to 500°C with a residence time of less than 60 seconds and wherein the copper content of the catalyst is from 0.5 to 25 % by weight and the catalyst contains, as a promoter, oxides, hydroxides or alcoholates of potassium, didymium or mixtures of same in an amount from 0.01 to 10 % by weight, based on the copper catalyst.

3,932,519

7,7A-DIHYDRO-4-[2-(3-ALKOXYPHENYL)-2-HYDROXYETHYL]-7A-ALKYL-1, 5(6H)-INDANDIONES,3,4,8,8A-TETRAHYDRO-5-[2-(3-ALKOXYPHENYL)-2-HYDROXYETHYL]-8A-ALKYL-1,6(7H)-NAPHTHALENEDIONES AND PROCESSES FOR THE PREPARATION THEREOF UTILIZING ASYMMETRIC INDUCTION

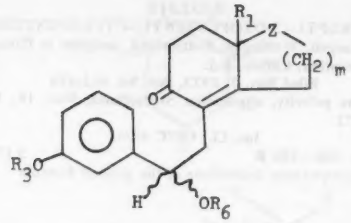
Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 100,372, Dec. 21, 1970, abandoned. This application Oct. 16, 1973, Ser. No. 406,980

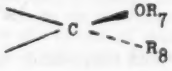
Int. Cl.² C07C *49/84*

U.S. Cl. 260—590 11 Claims

1. The compound of the formula



where R_1 is a primary alkyl group of from 1 to 5 carbon atoms;
R_3 is a cycloalkyl group, or a primary alkyl group of from 1 to 8 carbon atoms;
R_6 is hydrogen;
Z is carbonyl or a group of the formula



where
R_7 is hydrogen, lower alkyl or aryl lower alkyl, and
R_8 is hydrogen or lower aliphatic hydrocarbyl; and *m* is 1 or 2.

3,932,520

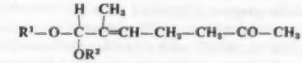
2-METHYL-2-HEPTEN-6-ON-1-AL ACETALS

Werner Hoffmann, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Germany

Division of Ser. No. 228,266, Feb. 22, 1972, Pat. No. 3,840,559. This application June 3, 1974, Ser. No. 476,065
Claims priority, application Germany, Feb. 24, 1971, 2108649
Int. Cl.² C07C *49/20*
U.S. Cl. 260—594 2 Claims

1. A compound of the formula (I):

(I)



where R^1 and R^2 each is an alkyl group of one to eight carbon atoms.

3,932,521

PROCESS FOR MANUFACTURE OF KETONES FROM OLEFINS

Stewart E. Gloyer, Arlington Heights, Ill., and Lawrence A. Fury, Memphis, Tenn., assignors to Kraftco Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 113,627, Feb. 8, 1971, abandoned. This application Mar. 8, 1974, Ser. No. 449,328
Int. Cl.² C07C *45/04*
U.S. Cl. 260—597 B 5 Claims

1. In a process for preparing a reaction product including ketone compounds from a reaction mixture comprising water, an unsaturated hydrocarbon having from five to 20 carbon atoms per molecule wherein the unsaturation in said hydrocarbon resides solely in from one to four olefin double bounds and wherein there is at least one hydrogen atom on each carbon atom of at least one of said olefin double bonds, a catalyst comprising a water soluble salt of a metal of the platinum group, and an oxidizing agent having oxidizing potential higher than that of the platinum group metal salt, the improvement comprising including in said reaction mixture a polar solvent and a high boiling solvent, said polar solvent being selected from the group consisting of methanol, ethanol, propanol, n. butanol, sec. butanol, dimethylformamide and mixtures thereof, said high boiling solvent being selected from diethylene glycol, 1,5-pentanediol, 1-decanol, 1-nonanol, 1-dodecanol tetrahydrofurfuryl alcohol, hexylene glycol, glycerol, peracresol, 1,4-butanediol, dipropylene glycol, benzonitrile, hexanoic acid, octanoic acid, decanoic acid, polyropylene glycol, and mixtures thereof, said polar solvent being present in said reaction mixture at a level of from about 20 percent to about 60 percent by weight of said high boiling solvent, said unsaturated hydrocarbon being present in said reaction mixture at a level of from about 0.5 to about 1200 percent by weight of said high boiling solvent, effecting a substantial conversion of said unsaturated hydrocarbon to a ketone compound in the presence of an oxygen containing gas and separating a reaction product including said ketone compound from said platinum group metal salt and said high boiling solvent by distillation.

3,932,522

MANUFACTURE OF FORMALDEHYDE

Karl Seither; Guenther Matthias, both of Ludwigshafen; Hans Diem, Mannheim; Oskar Hussy, and Hans Haas, both of Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 22, 1972, Ser. No. 236,971
Claims priority, application Germany, Mar. 25, 1971, 2114370
Int. Cl.² C07C *47/04*
U.S. Cl. 260—603 HF 9 Claims

1. In a process for the manufacture of formaldehyde by oxidative dehydrogenation of methanol in the presence of a silver catalyst at elevated temperature, the improvement comprising carrying out the reaction using crude methanol which is caused to impinge in vapor form against baffle plates before entering the catalyst zone, the impurities which separate at said baffle plates in solid or liquid form being collected.

3,932,523

PROCESS FOR PREVENTING THE FORMATION OF AN EMULSION WHEN WORKING UP REACTION MIXTURES CONTAINING BUTYRALDEHYDES AND COBALT

Max Strohmeyer, Limburgerhof; Helmut Walz, Ludwigshafen; Max Appl, Dannstadt-Schaurnheim; Hans Moell, Heidelberg; Horst Kerber, Ludwigshafen, and Heinz Hohenschutz, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 20, 1975, Ser. No. 542,709
Claims priority, application Germany, Feb. 1, 1974, 2404855
Int. Cl.² C07C *45/08*
U.S. Cl. 260—604 HF 7 Claims

1. In a process for preventing the formation of an emulsion when working up an oxo reaction mixture containing a butyraldehyde and cobalt by treatment with a gas containing molecular oxygen in an aqueous acid medium at an elevated temperature of from 60° to 160°C, followed by separation of the aqueous phase containing cobalt, the improvement comprising using at least twice the amount of molecular oxygen stoichiometrically required for the oxidation of the cobalt per gram atom of cobalt present in the oxo reaction mixture.

3,932,524

PROCESS FOR THE PREPARATION OF PHOSPHINE OXIDES AND SULPHIDES

Etienne Rouget De Gourcez, Paris, and Jean-Claude Mayeux, Bouchet, both of France, assignors to Societe Nationale des Poudres et Explosifs, France

Filed Nov. 1, 1972, Ser. No. 302,638
Claims priority, application France, Nov. 10, 1971, 71.40229
Int. Cl.² C07F 9/53
U.S. Cl. 260—606.5 P 8 Claims

1. A process for the preparation of phosphine oxides or sulphides of the formula:

in which R is a linear or branched aliphatic radical containing 5 – 12 carbon atoms, aralkyl radical selected from the group consisting of lower alkyl of 2 – 3 carbon atoms substituted by a phenyl group or R is cyclohexyl and X is an oxygen or sulphur atom which comprises reacting a halo-compound of the formula R—Hal, in which Hal is chlorine, bromine or iodine, with magnesium to form a Grignard derivative of the formula RMgHal, said reaction being carried out initially in a very small amount of diethyl ether and then in a solvent mixture containing a preponderant amount of an aliphatic or aromatic hydrocarbon, which is liquid at room temperature or triethylamine, adding phosphorus oxychloride or phosphorus sulphochloride to the reaction mixture containing the Grignard derivative, and isolating the phosphine oxide or phosphine sulphide formed by removing the solvent by steam stripping or steam distillation.

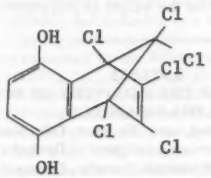
3,932,525

MOLECULAR COMPLEXES OF DMSQ

Julian R. Little, Hendersonville, N.C.; Walter Nudenberg, West Caldwell, N.J., and Yong S. Rim, Waterbury, Conn., assignors to Uniroyal Inc., New York, N.Y.

Division of Ser. No. 347,455, April 3, 1973, Pat. No. 3,832,422, which is a continuation-in-part of Ser. No. 80,747, Oct. 14, 1970, abandoned. This application Feb. 26, 1974, Ser. No. 445,885
Int. Cl.² C07C 147/10
U.S. Cl. 260—607 D 1 Claim

1. A molecular complex of the formula



·DMSO,

wherein DMSO represents dimethylsulfoxide.

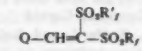
3,932,526

FLUOROALIPHATICSULFONYL SUBSTITUTED ETHYLENES

Robert J. Koshar, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 25, 1972, Ser. No. 300,754
Int. Cl.² C07C 147/04
U.S. Cl. 260—607 A 6 Claims

1. A fluoroalkylsulfonyl ethylene compound having the formula



wherein Q is a monovalent organic radical selected from the group consisting of $Z(CR{=}CR')_n{-}$, aryl, and arylmethyl, wherein R is hydrogen, an alkyl group, or a phenyl group, R′ is the same as R with at least one being hydrogen, and N is an integer from 1 to 7, Z is hydrogen, alkyl, alkenyl, aryl, arylalkyl, or alkylaryl, and R_f and R'_f are monovalent saturated perfluoroalkyl radicals each having from 1–18 carbon atoms.

3,932,527

PREPARATION OF P-P-DISUBSTITUTED DIARYL TRICHLOROETHANES

Robert L. Metcalf, and Asha Hirwe, both of Urbana, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Nov. 19, 1973, Ser. No. 417,420
Int. Cl.² C07C 149/32
U.S. Cl. 260—609 F 5 Claims

1. A process for preparing mixtures of asymmetrical p-p′-disubstituted diphenyl trichloroethanes which comprises reacting chloral and a substituted benzene, wherein the substituents are selected from the group consisting of $-CH_3$, $-CH_2O$, $-SCH_3$, $-C_2H_5O$, $-C_3H_7O$, $-C_3H_7$ and $-CL$, together substantially all at once in the presence of an acidic condensing agent selected from the group consisting of (1) a mixture of sulfuric acid-glacial acetic acid and (2) anhydrous aluminum trichloride and at a low temperature in the range of about 0°C to about −30°C, the amount of chloral and substituted benzene being sufficient to form the said trichloroethanes.

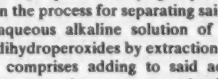
3,932,528

PROCESS FOR THE SEPARATION OF DIHYDROPEROXIDES

Hideaki Suda, Takaishi; Iwao Dohgane, Nishinomiya; Takashi Chinuki, Toyonaka; Kenji Tanimoto; Hirokazu Hosaka, both of Minoo; Yukimichi Nakao, Kobe; Yuji Ueda, Izumiotsu; Seiya Imada, Sakai; Hideki Yanagihara, Toyonaka, and Kunihiko Tanaka, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 27, 1973, Ser. No. 391,873
Claims priority, application Japan, Sept. 8, 1972, 47-90568
Int. Cl.² C07C 179/02
U.S. Cl. 260—610 A 1 Claim

1. A process for stabilizing dihydroperoxides of dialkyl aromatic hydrocarbons of the formula



wherein R_1 and R_2 represent alkyl groups of three to four carbon atoms, in the process for separating said dihydroperoxides from an aqueous alkaline solution of hydroperoxides containing the dihydroperoxides by extraction with an organic solvent, which comprises adding to said aqueous alkaline solution prior to extraction a compound selected from the group consisting of ammonia, aniline, toluidine, diphenylamine, N-methylaniline, N,N-dimethylaniline, benzylamine, α-phenylethylamine, triethylamine, pyridine and urea, the amount of said compound being 0.01 to 1% by weight based on the weight of said aqueous alkaline solution.

3,932,529
HALOCYCLOPROPYL HALOMETHYL ETHERS

Charles A. Billings, Concord; Gerald J. O'Neill, Arlington; Charles W. Simons, Bedford, and Robert S. Holdsworth, Arlington, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Dec. 26, 1974, Ser. No. 536,411
Int. Cl.² C07C *43/02*
U.S. Cl. 260—611 R **1 Claim**

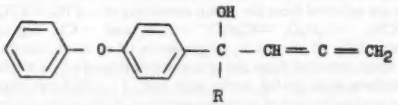
1. The cyclopropyl ethers selected from the group consisting of: 1-chloro-2-dichloromethoxy-1,2,3,3-tetrafluorocyclopropane, 1-chloro-2-difluoromethoxy-1,2,3,3-tetrafluorocyclopropane, 1-chloro-2-chlorofluoromethoxy-1,2,3, 3-tetrafluorocyclopropane, 1-bromo-2-dichloromethoxy-1,2,3,3-tetrafluorocyclopropane, 1-bromo-2-difluoromethoxy-1,2,3,3-tetrafluorocyclopropane, and 1-bromo-2-chlorofluoromethoxy-1,2,3,3-tetrafluorocyclopropane.

3,932,530
PHENOXYPHENYL-BUTADIENOLS

Paul L. Anderson, Dover, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Dec. 28, 1973, Ser. No. 429,402
Int. Cl.² C07C *43/20*
U.S. Cl. 260—613 R **3 Claims**

1. A compound of the formula:



wherein R is a hydrogen atom, methyl or ethyl.

3,932,531
METHOD OF MANUFACTURING ALKYLENE OXIDE ADDUCTS OF AN ALIPHATIC ALCOHOL

Naoji Kurata, Nishinomiya; Kazuo Koshida, Ashiya; Toshihiro Fujii, Moriguchi; Koichi Matsushiro, Achiya, and Yukio Okuda, Toyonaka, all of Japan, assignors to Nippon Shokubai Kaguku Kogyo Co., Ltd., Osaka, Japan

Filed July 14, 1972, Ser. No. 271,685
Int. Cl.² C07C *41/02*
U.S. Cl. 260—615 B **7 Claims**

1. In a method of manufacturing alkylene oxide adducts of an aliphatic alcohol comprising;

a. subjecting a saturated aliphatic hydrocarbon having 8 to 20 carbon atoms to oxidation by contacting said hydrocarbon with a molecular oxygen containing gas in the liquid phase in the presence of a boron compound which is capable of forming a boric acid upon contact with water to form a reaction mixture containing a borate ester,

b. maintaining said reaction mixture at a temperature between 100° and 200°C to esterify free alcohol for a period of time between 10 and 100 minutes,

c. distilling the esterified reaction mixture to obtain a crude borate ester residue and a distillate consisting essentially of unreacted hydrocarbon and volatile by-product,

e. contacting said residue with water at a temperature between 20° and 200°C to form an organic layer and an aqueous layer, wherein the weight ratio of water to said residue is between about 10: 1 to 1: 10,

f. separating said layers,

g. purifying said organic layer to obtain an alcohol,

h. admixing an alkylene oxide having 2 to 4 carbon atoms with said alcohol in the presence of an acid catalyst to form an addition reaction mixture, and

j. distilling said mixture to obtain a residue essentially consisting of an alkylene oxide adduct of the alcohol and an alcoholic distillate,

the improvement comprising

k. recycling 1 to 50 % by weight of said alcoholic distillate to any of the steps (b) or (c), and

l. recycling the remainder of said alcolic distillate to combine the remainder with the alcohol from step (g) introduced to alkoxylation step (h).

3,932,532
ETHERS OF POLYGLYCEROL

Robert H. Hunter, Mendenhall, Pa., and John David Zech, deceased, late of Wilmington, Del., by Mary Barth Zech, executrix, assignors to ICI United States, Inc., Wilmington, Del.

Filed June 1, 1973, Ser. No. 365,861
Int. Cl.² C07C *43/04, 41/02*
U.S. Cl. 260—615 R **14 Claims**

1. A method of preparing an alkyl ether of polyglycerol, said method comprising reacting (1) a purified polyglycerol containing from 8 to 12 glycerol units which polyglycerol has been purified by a process comprising

a. polymerizing glycerol in the presence of an alkaline catalyst to obtain a crude polyglycerol;

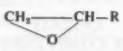
b. preparing an aqueous slurry, at a pH of from 10 to 12, of said crude polyglycerol and an inert, finely divided solid filtering aid;

c. separating a solid phase and a liquid phase of said slurry;

d. passing said liquid phase through an anionic exchange resin; and

e. subsequently passing said liquid phase through a cationic exchange resin

and (2) an alpha olefin epoxide of the general formula



wherein R is an alkyl group containing from 8 to 20 carbon atoms, provided that

i. the amount of epoxide employed is equal to at least 1 mol per mol of purified polyglycerol,

ii. the reaction is carried out under anhydrous conditions and at a temperature of 130° – 170°C, and

iii. the reaction is carried out in the presence of an alkali metal alkoxide catalyst in an amount equal to from 0.1% to 2.0% by weight based on the weight of polyglycerol employed.

8. A method, as claimed in claim **1**, wherein the amount of alkali metal alkoxide is equal to from about 0.5% to about 1.0% by weight based on the weight of polyglycerol.

3,932,533
PROCESS FOR THE RECOVERY OF PURE ALPHA-BISABOLOL

Otto Isaac, Bruchkobel, and Heribert Offermanns, Grossauheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

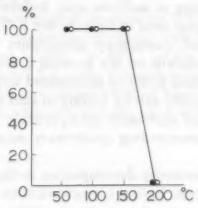
Filed Apr. 8, 1974, Ser. No. 459,205
Claims priority, application Germany, Apr. 7, 1973, 2317583
Int. Cl.² C07C *29/30*
U.S. Cl. 260—617 R **13 Claims**

1. A process for the purification of α-bisabolol originating from plants comprising the step of subjecting the impure α-bisabolol still containing odoriferous impurities to alkali hydroxide, alkali alkanoate of 1 to 8 carbon atoms, alkali cyclopentanolate, alkali cyclohexanolate, alkali benzyl alcoholate, alkali carbonate, alkali bicarbonate, alkaline earth hydroxide, alkaline earth oxide or aluminum hydroxide at a temperature of 20° to 60°C. under alkaline conditions and recovering the purified bisabolol.

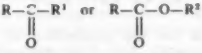
3,932,534
PROCESS FOR HYDROGENATION REACTION OF UNSATURATED ORGANIC COMPOUNDS

Yasuhisa Fukunaga, Takamatu, and Akira Okada, Takamatu, both of Japan, assignors to Kyowa Kagaku Kogyo Kabushiki Kaishi, Tokyo, Japan

Filed June 8, 1973, Ser. No. 368,327
Claims priority, application Japan, June 8, 1972, 47-56501
Int. Cl.[2] C07C *33/06, 31/02, 31/16*
U.S. Cl. 260—618 H 11 Claims



1. A process for hydrogenation of organic compounds which comprises reducing with hydrogen an unsaturated organic compound wherein the organic compound is a carbonyl compound expressed by the following formula



wherein R is an alkyl or aralkyl group having up to 12 carbon atoms, R^1 stands for a hydrogen atom or the group R, and R^2 stands for a lower alkyl group having up to 4 carbon atoms.

in the presence of a solid catalyst for reduction, wherein the solid reduction catalyst consists essentially of a product obtained by calcining and reducing at a temperature of 350° to 700°C. in a hydrogen stream a precursor compound having a composition expressed by the following general formula

$$M_xNi_yAl_z(OH)_{2x+2y+3z-tp}(A)_p \cdot aH_2O$$

wherein A stands for an anion, M stands for at least one metal selected from the group consisting of magnesium and zinc, t designates the valency of the anion A, and x, y, z, p and a are such numbers that when z is 2, the following relations are established:

$x+y=0.1$ to 20,
$x=0$ to 19.9, and
$y=0.1$ to 20

and the following conditions are satisfied:

$$1/6 > p/(x+y+z) > 1/20, \text{ and } a > 0$$

and having substantially the following diffraction pattern in the powder X-ray diffractiometry (Cu-Kα)

d (A)	I/Io
7.5 – 21.02	100
3.6 – 10.6	5 – 80
2.4 – 6.4	5 – 60

3,932,535
PROCESS FOR THE PREPARATION OF 2,2-BIS-(4-HYDROXY-3-CHLOROPHENYL)-PROPANE

Günter Zoche, Bonn-Beuel; Hermann Richtzenhain, Post Marialinden, and Roshdy Ismail, Neunkirchen, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Division of Ser. No. 261,827, June 12, 1972, Pat. No. 3,850,994, which is a continuation-in-part of Ser. No. 869,323, Oct. 24, 1969, abandoned. This application Feb. 15, 1974, Ser. No. 442,939
Claims priority, application Germany, Sept. 15, 1969, 1946610; Oct. 30, 1968, 1805920
Int. Cl.[2] C07C *37/22*
U.S. Cl. 260—619 A 15 Claims

1. A process for the purification of 2,2-bis-(4-hydroxy-3-chlorophenyl)-propane obtained by chlorinating 2,2-bis-(4-hydroxyphenyl)-propane which comprises forming a solution of said 2,2-bis-(4-hydroxy-3-chlorophenyl)-propane by mixing the same with a solvent thereof selected from the group consisting of benzene, toluene, chlorobenzene, 1,1,2,2-tetrachloroethane, methylenechloride, methyliodide, ethylbromide, trans-1,2-dichloroethylene, 1,2-dichloroethane, 1,2-dibromoethane and 1,4-dichlorobutane, adding sufficient water thereto to form a precipitate of said 2,2-bis-(4-hydroxy-3-chlorophenyl)-propane, water and said solvent, which precipitate is insoluble in the remaining solvent, removing said precipitate from impurities which remain dissolved in the reaction mixture obtained from said chlorination and recovering 2,2-bis-(4-hydroxy-3-chlorophenyl)-propane from said precipitate.

3,932,536
PROCESS FOR PREPARING HYDROXYDIPHENYL

Oskar Weissel, and Hans-Helmut Schwarz, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 11, 1974, Ser. No. 450,251
Claims priority, application Germany, Mar. 26, 1973, 2314947
Int. Cl.[2] C07C *37/06*
U.S. Cl. 260—620 5 Claims

1. In the process for the production of hydroxydiphenyl which comprises dehydrogenating a starting material containing hydrogenated hydroxydiphenyls in the gaseous phase in the presence of a dehydrogenation catalyst comprising nickel, chromium, aluminum, copper and alkali metal sulfate and/or alkali metal carbonate, the improvement which comprises purifying said starting material prior to dehydrogenating so as to be free of autoxidation products less volatile than the hydrogenated hydroxydiphenyls, free of peroxide compounds, and containing only acid products to such an extent that the acid number of the starting material is less than 0.2.

3,932,537
ALKYLATION OF PHENOLS

William H. Wetzel, Federal Way; Harold G. Nelson, and Frederic J. Shelton, both of Tacoma, all of Wash., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Continuation of Ser. No. 183,887, Sept. 9, 1971, abandoned. This application Aug. 9, 1974, Ser. No. 496,312
Int. Cl.[2] C07C *39/06*
U.S. Cl. 260—624 C 12 Claims

1. In a process for producing para-alkylated phenols comprising reacting at a temperature ranging from about 10° to about 185°C (A) a phenol which is at least one member selected from the group consisting ortho-tertiarybutyl phenol ertho-tertiarybutyl phenol and 2,4-ditertiarybutyl phenol and (B) an alkylating agent consisting of aliphatic olefins having from 20 to about 20 carbon atoms in the presence of (C) from about 0.05% to about 20% by weight based upon the amount of (A) used of an alkylation catalyst; the improvement consisting of using as the alkylation catalyst (C) an aryl sulfonic acid

which is at least one member selected from the class of highly acidic aryl sulfonic acids having a K value of at least 3.8×10^{-2}.

3. In a process for producing para-alkylated phenols comprising reacting at a temperature ranging from about 10° to about 185°C (A) a phenol which is at least one member selected from the group consisting of phenol ortho-tertiarybutyl phenol and 2,4-ditertiarybutyl phenol and (B) an alkylating agent consisting of aliphatic olefins having carbon to carbon linkages and from 2 to about 20 carbon atoms in the presence of (C) from about 0.5% to about 20% by weight based upon the amount of (A) used of an alkylation catalyst; the improvement consisting of using as the alkylation catalyst (C) an aryl sulfonic acid selected from the group consisting of meta-benzenedisulfonic acid, 2,4,6-trinitrobenzenesulfonic acid and trifluoromethane sulfonic acid.

3,932,538
PROCESS FOR PRODUCING PYROGALLOL AND DERIVATIVES THEREOF

Heitaro Obara; Junichi Onodera, both of Yonezawa; Akira Matukuma, Tokyo, and Kenji Yoshida, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

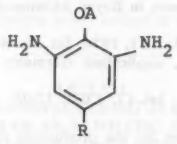
Filed Sept. 30, 1974, Ser. No. 510,754

Claims priority, application Japan, Sept. 29, 1973, 48-109977

Int. Cl.² C07C *39/10*

U.S. Cl. 260—625 **10 Claims**

1. A process for producing pyrogallol, which comprises: heating an aqueous solution of 4-substituted-2,6-diamino-phenol or 4-substituted-2,6-diamino-1-alkoxy benzene having the formula:



wherein R is alkyl, cycloalkyl, or aralkyl, respectively, having from 1 to 10 carbon atoms and having a tertiary carbon atom bonded directly to the nuclear benzene carbon atom, and A is hydrogen or alkyl, having from 1 to 10 carbon atoms at a temperature of 150°–300°C in the presence of hydrochloric acid, hydrobromic acid, sulfuric acid, phosphoric acid, methane sulfonic acid or trifluoromethane sulfonic acid.

3,932,539
PROCESS FOR PREPARING UNSATURATED TERPENE ALCOHOLS

Bernard J. Kane, Atlantic Beach, and Richard A. Von Genk, Jacksonville, both of Fla., assignors to SCM Corporation, New York, N.Y.

Filed Feb. 14, 1972, Ser. No. 226,325

Int. Cl.² C07C *29/02*, *33/02*

U.S. Cl. 260—631.5 **10 Claims**

1. An improved process for preparing a mixture of terpene alcohols consisting essentially of myrcenol, and at least 20% cis-ocimenol and trans-ocimenol, comprising the steps of:

A. reacting an acyclic terpene allylic halide selected from the group consisting of geranyl, neryl and linalyl halides and mixtures thereof with a tertiary amine at a temperature in the range of about −20°C to about 100°C to form a corresponding quaternary ammonium halide salt, said tertiary amine being a compound represented by the formula:

wherein

a. R_1, R_2 and R_3 are lower alkyl groups having 1–2 carbon atoms,

b. R_1 and R_2 are lower alkyl groups having 1–2 carbon atoms and R_3 is a 6 or 7 carbon cycloalkyl, aralkyl or aryl hydrocarbon group:

c. or said tertiary amine is a compound selected from the group consisting of N-alkyl morpholine, N-alkyl piperidine, the alkyl group being ethyl or methyl, N-cyclohexyl morpholine, N-cyclohexyl piperidine and N-methyl dicyclohexylamine and tri-n-butylamine;

B. acidifying said salt by adding to said reaction mixture a 1.0 N to 6.0 N aqueous solution of a mineral acid of the group consisting of sulfuric acid, hydrochloric acid, and orthophosphoric acid to hydrate the 6–7 ethylenic unsaturation of said quaternary ammonium salt to form an hydroxy substituent on the seventh carbon atom;

C. neutralizing said hydroxy substituted terpene quaternary ammonium halide salt by adding to said mixture an aqueous solution of carbonate or hydroxide alkaline base to form the corresponding quaternary ammonium hydroxide; and

D. thereafter thermally decomposing in the presence of an alkaline solution having a concentration of at least 25% at a temperature above about 100°C to below about 170°C the 7-hydroxy substituted terpene quaternary ammonium hydroxide to form a mixture the major portion of which consists essentially of myrcenol, cis-ocimenol and trans-ocimenol.

3,932,540
PROCESS FOR THE PRODUCTION OF 2,3-DIBROMO-1-ROPANOL

Henry Gould, Englishtown, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed May 13, 1974, Ser. No. 469,353

Int. Cl.² C07C *31/34*

U.S. Cl. 260—633 **8 Claims**

1. The process for the production of 2,3-dibromo-1-propanol that comprises contacting allyl alcohol with an approximately equimolar amount of bromine at a temperature between −10°C. and 60°C. and in the presence of a reaction medium that comprises a saturated aliphatic hydrocarbon having 3 to 12 carbon atoms and thereafter separating 2,3-dibromo-1-propanol from said reaction medium.

3,932,541
PROCESS FOR THE PREPARATION OF BROMINATED PENTAERYTHRITOLS

Ralph A. Davis, Midland; Ronald G. Tigner, Coleman; Joseph J. Pedjac, Mount Pleasant, and Laurence I. Peterson, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 171,334, Aug. 12, 1971, abandoned. This application May 24, 1973, Ser. No. 363,687

Int. Cl.² C07C *31/34*

U.S. Cl. 260—633 **9 Claims**

1. In the process for preparing brominated pentaerythritols by contacting pentaerythritol with HBr, the improvement comprising reacting the pentaerythritol with HBr in the liquid phase at a temperature of from about 85° to about 135°C. in a solvent selected from the groups consisting of benzene, toluene, xylene, a saturated hydrocarbon solvent, a substantially nonreactive brominated or chlorinated hydrocarbon solvent, and water, containing as a catalyst an alkanoic acid of from 2 to 8 carbon atoms or its anhydride having a concentration of from about 0.8 to about 25 mole percent per mole of pentaerythritol, by feeding the HBr to the reactor containing

the pentaerythritol and solvent continuously throughout the reaction to saturate the reaction mixture with HBr while retaining in the reaction mixture until completion of the reaction water formed during the reaction and any water used as solvent.

3,932,542
PROCESS FOR PREPARATION OF 2,5-DIBROMO-P-XYLENE

Fred R. Gerns, West Lafayette, Ind., assignor to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Aug. 26, 1974, Ser. No. 500,833
Int. Cl.² C07C *25/08*
U.S. Cl. 260—650 R 12 Claims

1. Selective bromination process for 2,5-dibromo-p-xylene which comprises contacting p-xylene with bromine at a temperature of about −20°C. to 40°C. in the presence of from about 0.25 to about 5.0 mole percent based on the bromine of a hydrated iron containing catalyst having from about two to about six molecules of water per atom of iron present in the catalyst.

3,932,543
PROCESS FOR HALOGENATION OF CONJUGATED DIENES TO DIHALOGENATED BUTENE PRODUCTS

Richard A. Von Genk, and Carlos G. Cardenas, both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.

Filed Apr. 13, 1973, Ser. No. 350,755
Int. Cl.² C07C *21/04*
U.S. Cl. 260—654 H 9 Claims

1. In a process for addition halogenation of a conjugated diene with an elemental halogen of the group consisting of chlorine and bromine under halogenation conditions, the improvement for obtaining increased yield of 1,2- and 1,4-dihalogenated butene addition products comprising forming a reaction mixture comprising said conjugated diene and a dipolar aprotic solvent resistant to halogenation under such addition halogenation conditions in the proportion of about 0.1–0.6 moles dipolar aprotic solvent per mole of said diene.

3,932,544
PROCESS FOR PRODUCTION OF MESO-1,2,3,4-TETRACHLOROBUTANE

Billy J. Lovelace, Baytown, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed July 1, 1974, Ser. No. 484,944
Int. Cl.² C07C *17/04*
U.S. Cl. 260—658 R 11 Claims

1. In a process for the production of meso-1,2,3,4-tetrachlorobutane by contacting in a reaction zone trans-1,4-dichlorobutene-2 in the liquid phase with chlorine in the substantial absence of oxygen the improvement which comprises:

effecting said contacting at a temperature in the range of from about 50° to 100° C. in the absence of a catalyst by introducing the chlorine into the reaction zone containing the trans-1,4-dichlorobutene-2 at a rate of from about 0.01 to about 2.0 mole percent per minute based on the amount of trans-1,4-dichlorobutene-2 initially present, for a period of time sufficient to effect the desired chlorination of the trans-1,4-dichlorobutene-2.

3,932,545
ALKALI METAL-CONTAINING, ORGANOMETALLIC PRODUCTS

Constantinos G. Screttas, Athens, Greece, assignor to The National Hellenic Research Foundation, Athens, Greece

Filed Apr. 8, 1974, Ser. No. 458,582
Int. Cl.² C07F *1/00, 3/00*
U.S. Cl. 260—665 R 10 Claims

1. The hydrocarbon-soluble, alkali metal-containing, organometallic product of the reaction in an organic solvent at about −20 to −120°C. of an organo-alkali metal reactant with a di(organooxy)-alkaline earth metal reactant, wherein the organo moiety of the organo-alkali metal reactant has 1 to 20 carbon atoms and consists of one or more radicals selected from the group consisting of hydrocarbyl, ether, thioether, and pyridinyl radicals, each alkali metal atom of the organo-alkali metal reactant is directly bonded to a carbon atom of the organo moiety, the alkali metal is selected from the group consisting of sodium and lithium, the organooxy groups of the di(organooxy)-alkaline earth metal reactant are selected from the group consisting of alkoxy groups, alkoxyalkoxy groups, N,N-dialkylaminoalkoxy groups, alkylthioalkoxy groups, and P,P-diarylphosphinoalkoxy groups, each organooxy group has 1 to 18 carbon atoms, and the alkaline earth metal is selected from the group consisting of barium, calcium, strontium, and magnesium.

3,932,546
PREPARATION OF POLYENES

George H. Buchi, and Roger M. Freidinger, both of Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 8, 1974, Ser. No. 440,853
Int. Cl. C07c *13/00*
U.S. Cl. 260—666 C 17 Claims

1. A method of preparing polyenic organic compounds, comprising reacting an allyl alcohol with a sulfide of the following formula

$$R'-S-R''$$

in which R′ and R″ are the same or different nitrogen-containing substituents, bound to sulfur through a nitrogen atom, the remainder of R′ and R″ being electrophilic, to produce an allylic sulfone, reacting said sulfone with an organometallic compound selected from the group of alkyllithiums and alkali metal amides and a halogen selected from the group of bromine, chlorine and iodine.

3,932,547
HYDROGENATION OF ORGANIC COMPOUNDS

Joseph K. Mertzweiller, and Horace M. Tenney, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 253,765, May 16, 1972, Pat. No. 3,855,324, which is a continuation-in-part of Ser. No. 880,993, Nov. 28, 1969, Pat. No. 3,711,423, which is a continuation-in-part of Ser. No. 674,098, Oct. 10, 1967, abandoned. This application Aug. 22, 1974, Ser. No. 499,793
Int. Cl.² C07C *5/10*
U.S. Cl. 260—667 16 Claims

1. A process for the hydrogenation of a feed containing benzene comprising the steps of:

forming a catalyst by

impregnating a support containing at least about 0.1 millimoles of hydroxyl groups per gram of support, said support comprising alumina with an aqueous solution of a transition metal salt comprising nickel acetate;

heat-treating the impregnated support at a temperature of at least about 500°F.;

activating the heat-treated impregnated support by contacting same with an organometallic compound having the formula: QR_n, wherein Q is selected from Group I, II or III metals of the Periodic Chart of the Elements, R is selected from the group consisting of hydride and alkyl, aryl, alkaryl, aralkyl and cycloalkyl radicals containing

from 1 to about 20 carbon atoms and wherein N ranges from 1 to 3 and satisfies the valence of Q;

treating the activated supported metal complex in the presence of hydrogen at a temperature of at least about 300°F.;

and thereafter contacting said catalyst with said feed in the presence of a hydrogen-containing gas, thereby producing a hydrogenation reaction.

3,932,548

DEHYDROGENATION METHOD AND MULTIMETALLIC CATALYTIC COMPOSITE FOR USE THEREIN

Richard E. Rausch, Mundelein, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 301,006, Oct. 26, 1972, Pat. No. 3,801,498, which is a continuation-in-part of Ser. No. 142,079, May 10, 1971, Pat. No. 3,702,294, which is a continuation-in-part of Ser. Nos. 819,114, April 24, 1969, and Ser. No. 807,910, March 17, 1969, Pat. No. 3,740,328. This application Mar. 8, 1974, Ser. No. 449,403. The portion of the term of this patent subsequent to Apr. 2, 1991, has been disclaimed.

Int. Cl.² C07C *15/00, 3/28, 5/32*

U.S. Cl. 260—668 D **36 Claims**

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting said hydrocarbon, at dehydrogenation conditions, with a catalytic composite comprising a combination of a platinum group component, a rhenium component, a tin component and a Group IB component with a porous carrier material in amounts sufficient to result in a composite containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 2 wt. % rhenium, abut 0.01 to about 5 wt. % tin, and about 0.01 to about 5 wt. % of a Group IB metal, wherein substantially all of the platinum group component, the rhenium component, and the Group IB component are present in the corresponding elemental metallic states and wherein substantially all of the tin component is present in an oxidation state above that of the elemental metal.

3,932,549

PROCESS FOR PREPARING TERT-BUTYLSTYRENE

Naoya Kominami, Tokyo, and Nobuhiro Tamura, Oimachi, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed July 12, 1971, Ser. No. 161,886

Claims priority, application Japan, May 10, 1971, 46-30470

Int. Cl.² C07C *3/52, 15/02*

U.S. Cl. 260—669 R **4 Claims**

1. A process for preparing tert. butyl styrene which comprises reacting tert. butyl benzene with 1/50 to 3 moles of ethylene and 1/500 to 300 moles of oxygen per mole of tert. butyl benzene at a temperature between 50° and 300°C. and at a pressure up to 100 kg/cm² in the presence of a catalyst prepared by treating metallic palladium or a fatty acid salt thereof with pyridine.

3,932,550

PROCESS FOR PRODUCTION OF 2,6-DIMETHYL-1,3,6-CTATRIENE

Hiroyuki Morikawa, and Takahiro Sato, both of Ibaraki, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Japan

Filed Sept. 4, 1974, Ser. No. 503,162

Claims priority, application Japan, Sept. 8, 1973, 48-101375

Int. Cl.² C07C *11/00;* **C07F** *1/02*

U.S. Cl. 260—677 R **12 Claims**

1. A process for producing 2,6-dimethyl-1,3,6-octatriene from isoprene which comprises dimerizing isoprene in the presence of a catalyst composition comprising: (A) a zirconium component selected from the group consisting of one or more compounds represented by the formula $Zr(OR)_nCl_{4-n}$ wherein R is a chlorinated alkyl group containing two to 20 carbon atoms or a chlorinated cycloalkyl group containing three to 20 carbon atoms, and n is an integer of 1 to 4; (B) an aluminum component consisting of one or more compounds represented by the formula AlR'_mCl_{3-m} wherein R' is an alkyl group containing one to 10 carbon atoms, a cycloalkyl group containing three to 10 carbon atoms or an aryl group, and m is 1.5 or 2; and (C) a coordinating component selected from the group consisting of an oxygen-containing compound, a nitrogen-containing compound, a sulfur-containing compound, a phosphorus-containing compound, and mixtures thereof.

3,932,551

PROCESS FOR THE PREPARATION OF DIOLEFINS FROM OLEFINS

Robert K. Grasselli, Chagrin Falls; Dev. D. Suresh, Warrensville Heights, and James L. Callahan, Bedford Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 12, 1973, Ser. No. 405,940

Int. Cl.² C07C *5/48*

U.S. Cl. 260—680 E **7 Claims**

1. In the process for the oxidative dehydrogenation of an olefinic hydrocarbon of four to about 10 carbon atoms comprising contacting a mixture of the olefin and molecular oxygen with a catalyst at a temperature of about 200° to about 600°C., the improvement comprising

using as the catalyst a catalyst wherein the atomic ratios are described by the empirical formula

$$Te_a\ C_c\ D_d\ Fe_e\ Bi_f Mo_g O_x$$

wherein

C is an alkali metal, alkaline earth metal, Tl, In, Ag, Cu, Sn, Sb, rare earth metal or mixture thereof;

D is nickel, cobalt, magnesium, zinc, cadmium, manganese, calcium or mixture thereof;

and wherein

a is greater than zero to about 4;

c is 0 to about 4;

d is 0.1 to about 20;

e and f are 0.01 to 12;

g is 10 to 15; and

x is the number of oxygens required by the valence states of the other elements present.

3,932,552

INTEGRATED PROCESS FOR PRODUCING C_2 HYDROCARBONS FROM CARBON MONOXIDE AND HYDROGEN

Charles M. Starks, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Mar. 25, 1974, Ser. No. 454,488

Int. Cl.² C07C *3/40*

U.S. Cl. 260—682 **11 Claims**

1. A process for producing ethane and/or ethylene comprising

a. introducing hydrogen and carbon monoxide to a catalytic reaction zone, the mol ratio of hydrogen to carbon monoxide being in the range of about 1/1 to about 5/1;

b. reacting said hydrogen and carbon monoxide in the catalytic reaction zone to a conversion of at least 50 percent of the carbon monoxide and thereby producing a catalytic reaction zone effluent containing hydrogen, carbon monoxide, water, hydrocarbons, and oxygenated hydrocarbons, said reaction being carried out under conditions of temperatures in the range of about 150°C to 450°C, pressures in the range of atmospheric to about 75 atmospheres and space velocities in the range of 500 to 50,000 V/V/hr STP, in the presence of a Fischer-Tropsch catalyst containing iron, cobalt, nickel or ruthenium;

c. introducing directly to a hydropyrolysis zone at least a portion of the catalytic reaction zone effluent containing hydrogen, carbon monoxide, carbon dioxide, water, hy-

drocarbons and oxygenated hydrocarbons, together with any necessary hydrogen required to bring the mol ratio of hydrogen to total hydrocarbons and oxygenated hydrocarbons having at least three carbon atoms to at least 1/1;

d. hydropyrolyzing said catalytic reaction zone effluent to produce a hydropyrolysis zone effluent, said hydropyrolyzing being carried out under conditions of temperatures in the range of about 600°C to 900°C, pressures of at least 5 atmospheres gauge and residence times in the range of about 0.1 sec to 60 sec;

e. and recovering C_2 hydrocarbons from said hydropyrolysis zone effluent.

3,932,553
OLIGOMERIZATION OF PROPYLENE

Marcel Robert, Mont-Saint-Aignan, France, assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed July 26, 1974, Ser. No. 491,998

Int. Cl.² C07C *3/18*

U.S. Cl. 260—683.15 B **7 Claims**

1. In a process for oligomerizing propylene comprising oligomerizing a propylene feed in the liquid phase in the presence of a boron trifluoride catalyst and traces of water at a temperature between 0°C and 60°C to form oligomers, the improvement which comprises adding to said propylene feed an amount in the range of about 0.05 to about 1 weight percent, based upon the weight of propylene, of an olefinic diene to reduce the activity of said catalyst to thereby produce oligomers having an average number of carbon atoms per molecule of between about 15 to about 21 carbon atoms.

3,932,554
ISOMERIZATION OF SATURATED HYDROCARBONS WITH MORDENITE CATALYST CONTAINING FLUORINE AND CHLORINE

Sinji Takase, Kawasaki; Tomonori Shioiri, Yokohama, and Masaru Ushio, Kawasaki, all of Japan, assignors to Nippon Oil Company Ltd., Nishi Shimba, Japan

Continuation of Ser. No. 207,523, Dec. 23, 1971, abandoned. This application July 15, 1974, Ser. No. 488,540

Claims priority, application Japan, Apr. 13, 1971, 46-26120

Int. Cl.² C07C *5/30*

U.S. Cl. 260—683.68 **15 Claims**

1. In a process for the branch isomerization of saturated hydrocarbons at an elevated temperature of up to about 350°C. in the presence of a catalyst,

the improvement which comprises conducting said process with a catalyst prepared by

contacting a composition consisting essentially of from 0.01 to 2 weight percent of platinum or palladium supported on a natural or synthetic mordenite which is in hydrogen or ammonium form having a SiO_2/Al_2O_3 molar ratio in said mordenite of from 9 to 50

with a fluorine-containing halogenated hydrocarbon

at a temperature from 0° to 600°C., to provide in

said catalyst at least about .86 weight percent fluorine and containing chlorine in an amount less than about 0.2 weight percent.

3,932,555
SILICONE ELASTOMERS

John Eric Goodrich, and Francis Gowland Hutchinson, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

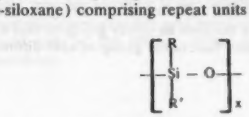
Filed July 16, 1973, Ser. No. 379,315

Claims priority, application United Kingdom, July 31, 1972, 35637/72

Int. Cl.² C08G *77/42*, *77/38*

U.S. Cl. 260—825 **13 Claims**

1. A reinforced silicone elastomer comprising a blend of from 95% to 20% by weight of cross-linked silicone elastomer and from 5% to 80% by weight of a polymeric material in which the reinforced silicone elastomer is formed from a composition comprising at least one cross-linkable poly(organo-siloxane) comprising repeat units having the structure



where x is an integer and the groups R and R′, which may be the same or different, are hydrocarbyl radicals or substituted hydrocarbyl radicals, and at least one polymerisable ethylenically unsaturated material, and in which a substantial proportion of the cross-linking of the polyorganosiloxane is effected before a substantial proportion of the ethylenically unsaturated material is polymerised, the ethylenically unsaturated material subsequently being polymerised.

3,932,556
THERMOSETTING RESIN COMPOSITION

Shigeru Takamori, Osaka; Eizi Morimoto, and Kahei Sakaguchi, both of Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

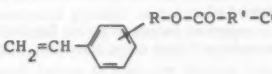
Filed Nov. 22, 1974, Ser. No. 526,109

Claims priority, application Japan, Nov. 27, 1973, 48-133214

Int. Cl.² C08L *63/00*

U.S. Cl. 260—836 **4 Claims**

1. A thermosetting resin composition consisting essentially of (1) a prepolymer having a terminal vinyl group, produced by reacting a polyepoxide compound with at least one equivalent, per epoxy group of said polyepoxide compound, of a dicarboxylic acid half ester having the formula



(I)

where R is a member of the group consisting of $—CH_2—$ and $—(CH_2—CHX—O)_{n-1}—CH_2—CHX—$, in which n is 1 to 4 and X is a member of the group consisting of H and CH_3, and R′ is a member of the group consisting of divalent aliphatic radical of 2 to 6 carbon atoms and a divalent aromatic radical of 6 to 7 carbon atoms, and (2) a vinyl monomer copolymerizable therewith or a mixture of said vinyl monomers.

3,932,557
REACTIVE HYDROPHILIC EPOXY CONTAINING POLYMER

Joseph S. Matthews, O'Hara Township, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 19, 1972, Ser. No. 316,451

Int. Cl.² C08L *63/00*; C08F *28/00*, *220/42*; C08L *89/00*

U.S. Cl. 260—837 R **6 Claims**

1. A solid, hydrophilic epoxy containing polymer which is the reaction product of the free radical polymerization at the olefinic double bonds without substantial epoxy reaction of (a) about 70 to 95 mol percent of a substituted olefin monomer having the formula

$$CH_2=C(R_1)-R_4$$

in which R_1 is hydrogen or methyl and R_4 is cyano or lower carboalkoxy with (b) about five to about 30 mol percent of an epoxy monomer containing terminal unsaturation and one 1,2-epoxy group in which the epoxy monomer is the reaction product of (1) a diepoxide with (2) a difunctional olefin at a mol ratio of diepoxide to difunctional olefin of about one to one, said difunctional olefin having an unsaturated group and a second functional group and defined by the structural formula $CH_2=C(R_1)-R_2$

in which R_1 is hydrogen or methyl and R_2 is carboxyl; hydroxymethyl; formyl; chlorocarbonyl, carbamyl; aminomethyl; mercaptocarbonyl; mercaptomethyl; lower alkyl or phenyl substituted hydroxyphenyl; or

$-CH_2NHR_3$

where R_3 is lower alkyl, hydroxyphenyl or lower alkyl substituted hydroxyphenyl, and said diepoxide having reacted with the difunctional olefin through an epoxy group of said diepoxide with the said second functional group of said difunctional olefin.

3,932,558

HEAT SEALABLE ADHESIVE PRODUCT AND METHOD OF MAKING THE SAME

Donald O. Kest, 6258 Fairhaven Road, Mayfield Heights, Ohio 44124, and John M. Questel, 2829 Lakeland Parkway, Cuyahoga Falls, Ohio 44221

Filed July 2, 1973, Ser. No. 375,457. The portion of the term of this patent subsequent to July 3, 1990, has been disclaimed.

Int. Cl.² C08L *63/00*

U.S. Cl. 260—841 **13 Claims**

1. An elastomer-based, heat sealable adhesive composition which is essentially tack-free, as cured, and having an improved balance of physical and chemical properties characteristics including improved peel adhesion, tack and creep resistance characteristics together with the capability to selectively vary such characteristics adapted for formation in situ on a substrate by the chemical formation of an elastomer base material in the presence of a compatible resin material comprising,

I. An elastomer base material which is adapted for chemical formation in situ on said substrate and which comprises the reaction product of:

A. a reactive component having reactive functionality and which includes a liquid diene telechelic polymer material,

B. a coreactive component having coreactive functionality capable of reacting with said reactive functionality and which includes an organic coreactant material capable of coreacting with said reactive functionality of said diene telechelic polymer material, in the presence of

II. A compatible resin material, said resin material being present in the amount of at least about 100 to 200 parts by weight of resin material per 100 parts by weight of elastomer material.

3,932,559

ADHESION OF OLEFIN COPOLYMER RUBBER TO NYLON TEXTILE

Stephen E. Cantor, Cheshire, and Arthur A. Blaskiewicz, Danbury, both of Conn., assignors to Uniroyal Inc., New York, N.Y.

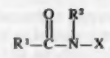
Filed Jan. 25, 1974, Ser. No. 436,416

Int. Cl.² C08L *61/06, 23/28*

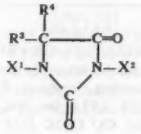
U.S. Cl. 260—847 **8 Claims**

1. An adhesive composition, which adheres firmly to nylon fabric when vulcanized in contact therewith, comprising a mixture of

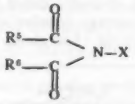
A. a reaction product of an elastomeric terpolymer consisting of ethylene, propylene and a copolymerizable nonconjugated diene with from 0.05 to 15 parts, per 100 parts by weight of the said terpolymer, of an N-haloamide selected from the group consisting of N-halomonoamides of formula I, N-halohydantoins of formula II, N-halosuccinimides of formula III, N-haloglycolurils of formula IV and trihaloisocyanuric acids of formula V, as follows:

I. 

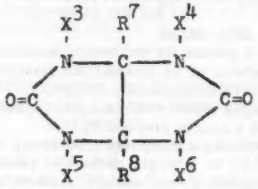
wherein R^1 is selected from the group consisting of alkyl having 1 to 8 carbon atoms and cycloalkyl having 5 to 8 carbon atoms, R^2 is selected from the group consisting of hydrogen, alkyl having 1 to 10 carbon atoms, aralkyl having 7 to 10 carbon atoms and cycloalkyl having 5 to 8 carbon atoms, and X is selected from the group consisting of chlorine, bromine and iodine;

II. 

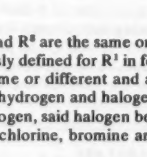
wherein R^3 and R^4 are the same or different and are as previously defined for R^1 in formula I, and X^1 and X^2 are the same or different and are selected from the group consisting of hydrogen and halogen provided that at least one of them is halogen, said halogen being selected from the group consisting of chlorine, bromine and iodine;

III. 

wherein R^5 and R^6 are the same or different and are as previously defined for R^1 in formula I, or may be alkylene having 1 to 4 carbon atoms joined directly together or through a chain of up to 4 methylene groups, and X is as previously defined for formula I;

IV. 

wherein R^7 and R^8 are the same or different and are hydrogen or as previously defined for R^1 in formula I, and X^3, X^4, X^5 and X^6 are the same or different and are selected from the group consisting of hydrogen and halogen provided that at least one of them is halogen, said halogen being selected from the group consisting of chlorine, bromine and iodine; and

V. 

wherein X^7, X^8 and X^9 are the same or different and are halogen selected from the group consisting of chlorine, bromine and iodine,

with (B) from 0.2 to 10 parts, per 100 parts by weight of the said terpolymer, of a resorcinol-alkyl aldehyde condensation product wherein the aldehyde contains from 2 to 4 carbon atoms, said condensation product being made by condensation, in alcoholic or aqueous medium in the presence of an acid catalyst at a temperature up to reflux temperature, of from ½ to 1 mole of said aldehyde per mole of resorcinol.

3,932,560
HIGH-MOLECULAR WEIGHT ACIDIC POLYMERS

William E. Franklin, and Stanley P. Rowland, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 28, 1974, Ser. No. 501,416
Int. Cl.² C08F *120/06*
U.S. Cl. 260—851 **2 Claims**

1. A process for forming acidic polymers of high molecular weight comprising:

a. polymerizing a monomer system consisting essentially of at least 50% by weight of an acidic monomer selected from the group consisting of acrylic acid or methacrylic acid in a water solution containing a reagent selected from the group consisting of
dimethyloldihydroxyethyleneurea,
formaldehyde,
methyloltriazones, and
methylolcarbamates, the weight ratio of said reagent to acidic monomer being from 0.3 to 2.0,
using a free radical initiating system consisting of a persulfate oxidizing agent and a bisulfite reducing agent;

b. dialyzing the solution prepared in (a); and

c. drying the dialyzed solution.

3,932,561
ADHESIVES COMPRISING SOLUTIONS OF A MIXTURE OF A TERPENE URETHANE RESIN WITH THERMOPLASTIC POLYETHER POLYURETHANES CONTAINING TERTIARY AMINE GROUP

Joseph Zamer, Paramus, N.J., assignor to Inmont Corporation, New York, N.Y.

Division of Ser. No. 396,237, Sept. 11, 1973, Pat. No. 3,887,755. This application Nov. 12, 1974, Ser. No. 523,086
Int. Cl.² C08G *18/32*
U.S. Cl. 260—858 **6 Claims**

1. An adhesive composition consisting essentially of a volatile, water-miscible, organic solvent solution of a mixture of a minor amount of a terpene urethane resin which is the reaction product of a terpene alcohol with a polyisocyanate, and a major amount of a water soluble salt of a substantially linear thermoplastic polyurethane containing 0.5 to 2.5% by weight of nitrogen derived from tertiary amine groups and from 2 to 8% of nitrogen derived from isocyanate groups, said polyurethane being prepared by (a) reacting an excess of an isocyanate with a mixture of diols consisting of polyether diols having a molecular weight of from 425 to 4,000 and tertiary amine diols selected from the group consisting of N-phenyl dialkanol amine and N-lower alkyl dialkanol amines to obtain a reaction product having free isocyanate groups greater than 0.1 milliequivalents of NCO per gram of solution at 50% solids, (b) chain extending the reaction product with a chain extender selected from the group consisting of alkanol amines and alkylene diamines to obtain a chain extended polyurethane polymer containing from 0.07 to 0.01 milliequivalents of NCO per gram of 50% solution, (c) reacting the free isocyanate groups with a material selected from the group consisting of water miscible alcohols, water miscible acids and water, an amount of a water miscible acid being added sufficient to form the acid salts of the tertiary amine groups present on the polyurethane.

3,932,562
RESIN PRODUCED BY GRAFT-POLYMERIZING ETHYLENICALLY UNSATURATED POLYMERIZABLE COMPOUNDS ONTO A MERCAPTO GROUP CONTAINING ALKYD RESIN

Mitsuru Takahashi, Hirakata, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan

Filed Sept. 26, 1973, Ser. No. 400,819
Claims priority, application Japan, Oct. 2, 1972, 47-98782
Int. Cl.² C08G *39/00*
U.S. Cl. 260—873 **20 Claims**

1. A process for producing a resin which comprises graft polymerizing one or more ethylenically unsaturated polymerizable compounds onto a mercapto group-containing alkyd resin in a weight ratio of 5:95 to 70:30 said mercapto group-containing alkyd resin having mercapto groups in an amount of 1×10^{-5} to 1×10^{-2} gram equivalent/g, and said ethylenically unsaturated polymerizable compound(s) being one or more members selected from the group consisting of esters of acrylic acid and methacrylic acid with alkanols having 1 to 15 carbon atoms, styrene, α-methylstyrene, vinyltoluene, p-t-butylstyrene, acrylonitrile, methacrylonitrile, ethylenically unsaturated glycidyl carboxylates, ethylenically unsaturated monomers having at least one hydroxyl group, ethylenically unsaturated carboxylic acids, ethylenically unsaturated compounds having at least one blocked isocyanate group, acrylamide, methacrylamide, N-methylolacrylamide,N-alkoxymethylacrylamide having an alkyl moiety of 1 to 14 carbon atoms, diacetone acrylamide, hydroxymethyldiacetone acrylamide, N-methlolmethacrylamide, and N-alkoxymethylmethacrylamide having an alkyl moiety of 1 to 14 carbon atoms.

3,932,563
SELF-SEALING FILMS

Frederico Argurio, Brussels; Mario Borsatti, Overijse, and William James Busby, Tervueren, all of Belgium, assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Sept. 25, 1974, Ser. No. 509,228
Claims priority, application United Kingdom, Oct. 1, 1973, 45690/73
Int. Cl.² C08L *23/08*
U.S. Cl. 260—897 B **21 Claims**

1. A composition suitable for fabricating into a self-sealing film comprising (i) 90–99.95 wt. % of a copolymer of ethylene and a vinyl (or hdyrocarbyl substituted vinyl) ester of a C_1-C_{20} monocarboxylic acid, (ii) either 0.05 to 10 wt. % of a hydrocarbon resin selected from the group consisting of a polyterpene and a polymerization product of a petroleum distillate fraction, or 0.05 to 5 wt. % of the hydrocarbon resin and 0.05 to 5 wt. % of polybutylene or polyisobutylene, provided the combined weight of the hydrocarbon resin and polybutylene or polyisobutylene is not more than 10 wt. % and (iii) 0.01 to 3.0% by weight based on the combined weight of (i) and (ii) of a partial carboxylic acid ester of a polyol wherein said ester is derived from a C_{10}–C_{34} carboxylic acid and wherein said ester contains at least one unesterified hydroxyl group.

3,932,564
ELECTROCONDUCTIVE RESINS AND PROCESS OF PREPARATION

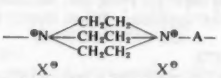
Albert H. Markhart, Wilbraham, and James O. Santer, East Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of Ser. No. 253,016, May 15, 1972, Pat. No. 3,825,511. This application July 5, 1974, Ser. No. 486,040

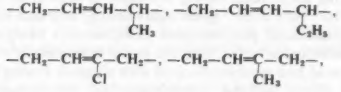
Int. Cl.² C08F *15/02, 3/32*

U.S. Cl. 260—899 **14 Claims**

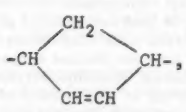
1. A resin composition comprising from 20 to 60 parts by weight of a poly(vinyl alcohol) and from 40 to 80 parts by weight of a poly(quaternary ammonium) resin, wherein the poly(vinyl alcohol) contains in the range of 1 to 40 weight percent of unhydrolyzed vinyl acetate units and has a weight average molecular weight in the range of 2000 to 500,000 and wherein the poly(quaternary ammonium) resin contains recurring units of:



wherein X is chlorine or bromine and A is a divalent radical selected from the group consisting of $-CH_2-CH=CH-CH_2-$,



and



and wherein the degree of polymerization is such that the resin has an intrinsic viscosity of at least 0.05 determined on a 2 percent aqueous sodium chloride solution at 25°C.

3,932,565
POLYMERIC BROMINE-CONTAINING PHOSPHORAMIDATE POLYOLS

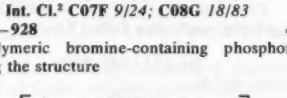
Wadim Batorewicz, New Haven, Conn., assignor to Uniroyal Inc., New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 430,995

Int. Cl.² C07F *9/24*; C08G *18/83*

U.S. Cl. 260—928 **4 Claims**

1. A polymeric bromine-containing phosphoramidate polyol having the structure



wherein R is a radical having the formula $-NR_2R_3$ wherein R_2 and R_3 can be the same or different and are alkyl radicals having from 1 to 6 carbon atoms, phenyl or aralkyl or alkaryl radicals having from seven to twelve carbons atoms; R_1 is a diradical selected from $-CH_2CH_2-$, $-CH(CH_3)CH_2-$, $-CH(CH_3)CH_2CH_2-$, $-CH_2CH=CHCH_2-$, $-CH_2CCH_2-$, $-CH(CH_2Br)CH_2-$, $-CH(CH_2Cl)CH_2-$, $-CH_2C(CH_2Br)_2CH_2-$, $-CH_2C(CH_2Cl)_2-$, $-CH_2CH_2-O-CH_2CH_2-$, $-CH_2CH_2-O-CH_2CH_2-O-CH_2CH_2-$ and $-CH(CH_3)CH_2-O-CH_2CH(CH_3)-$; and n is an integer of from 1 to 5.

3,932,566
PHOSPHONATE POLYMERS

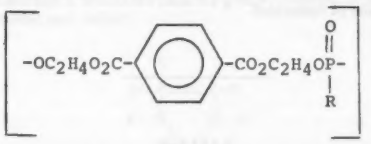
Arthur M. Reader, Waynesboro, Va., assignor to Celanese Corporation, New York, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,065

Int. Cl.² C07F *9/40*

U.S. Cl. 260—930 **3 Claims**

1. A class of phosphonate polymers characterized by the structural formula:



wherein R is selected from alkyl and substituted alkyl radicals containing between 1 and about 6 carbon atoms, the substituents being selected from halogen, alkenyl, alkoxyl and nitro groups, and aryl and substituted aryl radicals containing between 6 and about 10 carbon atoms, the substituents being selected from halogen, alkoxyl and nitro groups; and n is an integer between 5 and about 5,000.

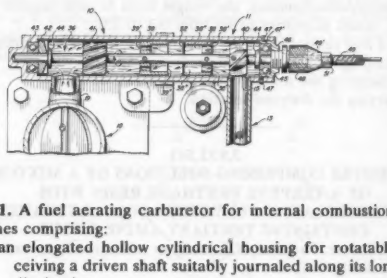
3,932,567
GAS AERATING CARBURETOR

Paul E. Skidmore, 2941 E. McDowell Road, Phoenix, Ariz. 85008

Filed July 5, 1974, Ser. No. 485,973

Int. Cl.² F02M *17/16*

U.S. Cl. 261—30 **4 Claims**



1. A fuel aerating carburetor for internal combustion engines comprising:

an elongated hollow cylindrical housing for rotatably receiving a driven shaft suitably journaled along its longitudinal axis,

a driven shaft rotatably journaled along the longitudinal axis of said housing,

at least one pair of aerating members mounted on said shaft for rotation therewith,

said aerating members being spacedly mounted on said shaft and each comprising a cylindrical casing having a plurality of spacedly arranged bores in one end thereof and a plurality of radial fins arranged in the other end thereof,

said fins of the first aerating member in the direction of air-fuel mixture through said housing being juxtapositioned to the bores in said second aerating member,

said radial fins receiving an air-fuel mixture on one side thereof and thoroughly mixing and atomizing said mixture as it passes therethrough,

an inlet port for receiving and mixture at one end of said housing and an outlet port at the other end of said housing,

said inlet port being connected to a first air-horn which furnishes an air-fuel mixture to said carburetor,

said outlet port being connected to a second air-horn of a second carburetor of an internal combustion engine for

transmitting thereto said thoroughly mixed air-fuel mixture, and

means connected to said shaft for rotation thereof.

3,932,568

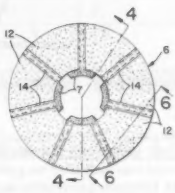
HIGH-ENERGY BRAKE AND BRAKE COMPONENTS

Willie H. Watts, Massillon; Francis J. Lowey, deceased, late of Medina County, Ohio, by Old Phoenix National Bank, executor, Medina, Ohio, assignors to Friction Products Inc., Medina, Ohio

Filed June 26, 1973, Ser. No. 373,802

Int. Cl.² B29C 25/00

U.S. Cl. 264—29 17 Claims



1. A method of making a friction element suitable for receiving the rapidly dissipated energy produced in stopping jet aeroplanes, said method comprising (a) coating a finely powdered graphite, graphite fibers, and an abrasive powder that is stable at graphitizing temperatures with a heat-setting, resole phenol-aldehyde resin, said resin being heat-setting to the infusible, insoluble state, removing volatiles therefrom while in the powdery state and at a temperature maintained below resin-curing temperatures; (b) preparing an intimate mixture of 1 to 10 percent by weight of said fibers, 40 to 70 percent by weight of said graphite powder, 1 to 10 percent by weight of said abrasive powder, and 20 to 45 percent by weight of said resin; (c) compressing said intimate mixture to form a preform at a pressure of 10 to 25 TSI but at a pressure below that which forms an impervious skin over the surface of said preform; (d) curing said preform to complete condensation of said resin binder while allowing vapors evolved to escape without rupturing said preform; (e) carbonizing said cured preform by slowly raising the temperature thereof to carbonize said resin while permitting gas or vapors formed to escape without rupture of said preform; and (f) graphitizing the carbonized preform by raising the temperature thereof at a controlled rate to between 1800° C. and 2500° C.

3,932,569

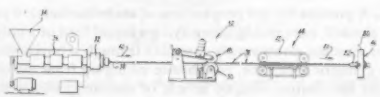
METHOD FOR PRODUCING FREE-FLOW INTERLOCKING FOAMED PACKING MATERIAL

Gunter G. Fuss, Daly City, Calif., assignor to Free-Flow Packaging Corporation, Redwood City, Calif.

Division of Ser. No. 321,657, Jan. 8, 1973, Pat. No. 3,855,053, which is a continuation-in-part of Ser. No. 221,974, Jan. 31, 1972, abandoned. This application July 12, 1974, Ser. No. 487,901

Int. Cl.² B29D 23/04, 27/00

U.S. Cl. 264—51 7 Claims



1. In a method for the continuous manufacture of free-flow interlocking foamed expanded plastic material, the steps of extruding expanded plastic material to form at least one elongate hollow tube, continuously engaging outer surfaces thereof while still in a heat-softened state due to the heat of extrusion to cause adjacent tube wall surfaces to engage and adhere to one another only in a central zone as respects the cross section thereof so as to provide a cross-sectional configuration wherein central portions of the tube walls are adhered to one another at said central zone and outer portions are in the form of contiguous open hollow loops extending outwardly from said central zone, cooling said adhered portions and successively slicing through the tube walls substantially laterally to the tube axis at intervals to sever shallow lengths of partially expanded plastic material having substantially the configuration of a shallow bow.

3,932,570

METHOD OF SEALING FIBERS IN APERTURES

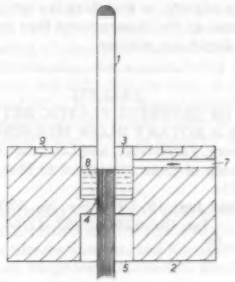
David Lloyd Cox, and Neil Patrick Hugh McDonnell, both of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 21, 1972, Ser. No. 236,635

Claims priority, application United Kingdom, Mar. 26, 1971, 7911/71

Int. Cl.² B29D 3/00, 31/00

U.S. Cl. 264—69 10 Claims



1. A process of sealing a bundle of substantially parallel fibres into a gap defined by at least one holding member, said gap having a cross-sectional size and shape substantially the same as the cross-sectional size and shape of said bundle, said process comprising:

introducing the bundle of fibres into said gap, contacting a pool of curable liquid sealing material with the fibres at their position of entry into said gap, said pool lying outside said gap, said pool being confined adjacent said gap and working sealing material between the fibres in the gap by vibrating the bundle longitudinally and causing said fibers to flex in the pool intermediate a point at which vibration is applied and said gap and curing said sealing material.

3,932,571

PROCESS FOR DYEING UNDRAWN ACRYLONITRILE POLYMER FILAMENTS

Lee Oleh Dworjanyn, Camden, S.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 310,955, Nov. 30, 1972, abandoned. This application Oct. 17, 1973, Ser. No. 407,264

Int. Cl.² D01F 6/18

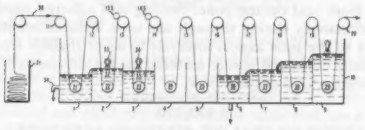
U.S. Cl. 264—78 7 Claims

1. A continuous process for dyeing dry-spun acrylonitrile polymer filaments which are substantially undrawn and contain in excess of 10% spinning solvent, by weight of the filaments, which comprises the following steps:

1. passing a bundle of said filaments through an aqueous extraction bath having a temperature below about 80°C., so that any imposed draw is nominal and at a rate of at least about 10 yards per minute, until the spinning solvent

content of the filaments is below about 10% by weight of the filaments;

2. squeezing the bundle of filaments under pressure sufficiently heavy to remove most of the extraction bath liquid therefrom;
3. passing the bundle of filaments into contact with a liquid dye mixture at a temperature below about 80°C. at nearly zero stretch;

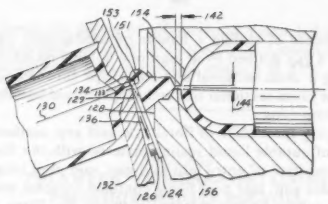


4. drawing the filaments between about 1.5× and 4.5× at a temperature between about 60° and 80°C. while the filaments are still in contact with the liquid dye mixture; and
5. removing excessive liquid by squeezing the bundle of filaments under pressure sufficiently light to retain upon the filaments an amount of liquid substantially greater than the amount present prior to their contact with the liquid dye mixture, so that there is a net pick-up of liquid dye mixture on the filaments and they remain in contact with the liquid dye mixture.

3,932,572
METHODS OF SEVERING PLASTIC BETWEEN BLOW MOLDS IN A ROTARY BLOW MOLDING MACHINE

Michael J. Avery, Forrestville, and Lawrence A. Martino, East Hartford, both of Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed June 19, 1974, Ser. No. 480,605
Int. Cl.² B29C *17/07, 17/14*
U.S. Cl. 264—99 **1 Claim**



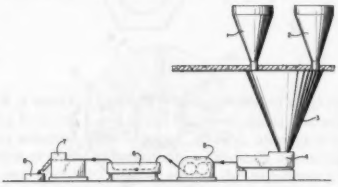
1. In a method of blowing molding hollow articles from thermoplastic material by radially moving one mold section toward another mold section to capture successive lengths of a continuously extruding thermoplastic parison in adjacent blow molds circumferentially spaced from each other as said molds traverse a rotary path about a horizontal axis, holding said sections closed while expanding the parison lengths to form the articles with portions of said continuous parison between said circumferentially spaced molds connecting blown articles in adjacent molds and incrementally moving the inner section of each mold substantially perpendicular to the horizontal axis while the next adjacent mold is still closed to at least partially sever a parison portion intermediate the opening and still-closed mold, the improvement in said method whereby the reliability of completeness of severing of each parison portion is improved, which improvement comprises the step of:

advancing a blade on the back face of the inner section of the opening mold along the front face across the parting line of said still-closed mold to shear the thermoplastic material of said each parison portion between said face and blade as a result of said incremental movement.

3,932,573
PROCESS FOR PRODUCING GLASS FIBER REINFORCED INJECTION MOLDING COMPOUNDS

Michael E. Kucsma; Gary J. Babcock, and Berlin C. Harris, Jr., all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 444,099, Feb. 20, 1974, abandoned, which is a continuation of Ser. No. 7,128, Jan. 30, 1970, abandoned. This application May 2, 1974, Ser. No. 466,279
Int. Cl.² B29F *3/00*
U.S. Cl. 264—118 **17 Claims**



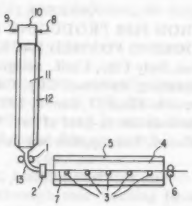
1. A process for the production of a thermoplastic composition comprising:

a. feeding a stream of glass fibers and a separate stream of organic plastic resin to a common hopper, said hopper being adapted to allow said glass fibers and said resin to free-fall into a screw extruder;
b. mixing and heating said resin and said glass fibers in said extruder until said resin is plastified;
c. extruding said mixture of said resin and said fibers;
d. milling said mixture to a sheet on a roll mill having rollers heated sufficiently hot to soften said mixture;
e. cooling said sheet to a rigid state; and
f. dicing said sheet into pellets.

3,932,574
PROCESS FOR PREPARING FIBROUS POLYVINYL ALCOHOL

Makoto Shiraishi; Sigetaka Iwata, and Masao Oura, all of Toyama, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed July 11, 1973, Ser. No. 378,213
Claims priority, application Japan, July 11, 1972, 47-69790
Int. Cl.² D01F *6/14;* B29H *7/18*
U.S. Cl. 264—147 **23 Claims**



1. A process for the preparation of shaped articles of polyvinyl alcohol, comprising saponifying a liquid feed of a polyvinyl ester as same downwardly cascades through a horizontal hollow cylindrical reactor, and thence taking-up from the reactor outlet the fibrous, shaped article of oriented, solid polyvinyl alcohol thus formed at a rate of from 50 to 1,500 cm/minute in the form of a continuous bar, wetting said bar with a non- or poor solvent for polyvinyl alcohol until same contains at least 25% by weight of volatile components and wet-stretching

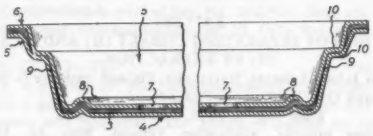
said bar at a temperature of from 50° to 200°C. whereby said bar is transformed into fibrous polyvinyl alcohol.

3,932,575

METHOD OF MAKING A MULTILAYERED PACKAGING TRAY BY DEEP-DRAWING

Sven Ingemar Andersson, Hollandaregatan 16, 271 00 Ystad, Sweden

Division of Ser. No. 241,574, April 6, 1972, Pat. No. 3,834,606. This application Mar. 19, 1974, Ser. No. 452,538
Int. Cl.² B29C *17/03*; B65D *81/26*
U.S. Cl. 264—154 2 Claims



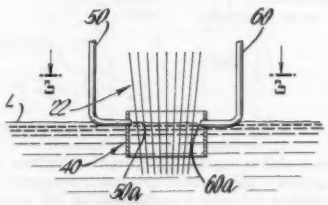
1. A method of making a packaging tray of a multilayered wall material including an intermediate layer of a substantially non-stretchable liquid-absorbing material and, on each side of said intermediate layer, one cover layer of a synthetic plastic material which is moldable and stretchable when heat softened, said tray having a bottom, side walls and a flange extending outwardly from said side walls around the periphery of the tray, said method comprising the steps of forming the inside cover layer with perforations, heating the multilayered wall material to soften the cover layers of synthetic plastic material, clamping the wall material in the area of the flange to be produced, deep-drawing the non-clamped parts of the heated wall material inwardly of said clamped flange forming wall material area for forming the bottom and side walls of the tray with the bottom not being subject to appreciable stretching and the cover layers being compressed and bonded due to their tacky condition, forming in the tray side walls during said deep-drawing an offset extending around the tray and being substantially plane parallel with the bottom of the tray and, during said deep-drawing and offset-forming steps, stretching the wall material in the offset area of the tray to an extent sufficient to at least partially rupture the intermediate wall layer and to bring together the cover layers and heat seal said layers to each other.

3,932,576

APPARATUS FOR AND METHOD OF MELT SPINNING

Pravin Patel, Columbia, Md., assignor to Concorde Fibers, Inc., Columbia, Md.

Filed Dec. 23, 1974, Ser. No. 535,459
Int. Cl.² D01D *3/00*, *5/00*
U.S. Cl. 264—178 F 6 Claims



1. In an apparatus for the melt spinning of a plurality of thermoplastic filaments, the apparatus comprising a vessel for containing a quench liquid and a spinneret arranged above the level to which the vessel is to be filled with the quench liquid so that molten filaments extruded through the spinneret enter the quench liquid wherein the filaments are solidified, the improvement comprising baffle means partially surrounding an area at the surface of the quench liquid at which the molten filaments enter the quench liquid said baffle means surrounding said area sufficiently to essentially eliminate vortexing and minimize random turbulence, and means for conducting a wetting agent to said area, said means comprising conduits having outlets at least approximately at the periphery of said area, the outlets being at least two in number and being at least approximately symmetrically located about said area.

3,932,577

METHOD FOR MAKING VOID-FREE ACRYLIC FIBERS

George Palethorpe, Durham, and Edwin W. Folk, Cary, both of N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed May 21, 1973, Ser. No. 362,632
Int. Cl.² D01F *6/18*
U.S. Cl. 264—182 4 Claims

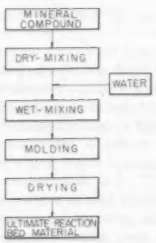
1. A process for wet spinning abrasion-resistant acrylonitrile-containing filaments having essentially void-free structures, comprising forming a spinning dope by dissolving (A) from about 20 to about 28 weight percent of a dry polymeric material containing about 35 to about 98 weight percent acrylonitrile and 65 to 2 weight percent of at least one other mono-olefinic monomer copolymerized with said acrylonitrile in (B) a mixture of about 1 to 8 weight percent water and about 62 to about 79 weight percent of a solvent selected from the group consisting of dimethylacetamide, dimethylformamide and dimethylsulfoxide, the weights being based on the weight of the dope, and extruding the dope at a temperature within the range of 40° C to 75° C into an aqueous solution of about 40 to 64 weight percent of said solvent at a coagulation temperature of from about 30° C to about 65° C.

2,932,578

METHOD OF MAKING REACTION BED MATERIAL FOR ARTIFICIAL MINERAL WATER PRODUCTION

Atsushi Nishino; Hiroshi Kumano, and Kazunori Sonetaka, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed July 13, 1973, Ser. No. 378,871
Claims priority, application Japan, July 14, 1972, 47-71008; July 14, 1972, 47-71009; Sept. 21, 1972, 47-95364; Sept. 22, 1972, 47-95578
Int. Cl.² B29B *1/04*
U.S. Cl. 264—331 2 Claims



1. A method of producing a molded bed material for use in the production of artifical mineral water comprising the steps of: mixing a mineral source powder comprising 40 to 100 mole % of magnesium carbonate with an aqueous solution of a bonding material permissible as a food additive selected from the group consisting of carboxymethyl cellulose, starch, gelatin and polyvinyl alcohol in an amount of 20 to 50% by weight of said powder, the concentration of said solution being from 0.5 to 10% by weight; kneading the resulting wet mixture; molding the kneaded mixture under pressure into pellets; and

drying said pellets at a temperature between room temperature and 850°C.

3,932,579

RECOVERY OF RHENIUM

Kenneth A. Morgan, Hoffman Estates, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 6, 1973, Ser. No. 422,500
Int. Cl.² C01G 47/00
U.S. Cl. 423—49 5 Claims

1. A process for the recovery of rhenium from an iron and molybdenum-containing hydrochloric acid solution thereof, which comprises:

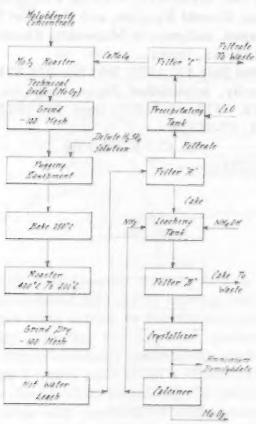
a. adding sufficient acid to the solution to establish a sulfate/chloride anion ratio therein of at least about 20:1;
b. admixing the resulting solution with a normally liquid, substantially water insoluble trialkyl phosphate and recovering the rhenium in the trialkyl phosphate phase of the mixture;
c. separating and washing the trialkyl phosphate phase with sulfuric acid for the removal of any residual iron and molybdenum contained therein, and thereafter with hydrochloric acid for the removal of entrained sulfuric acid;
d. separating the washed trialkyl phosphate and back extracting the same with from about 6 to about 11 normal nitric acid, and recovering the rhenium therein as a nitric acid solution of perrhenic acid.

3,932,580

PROCESS FOR PURIFYING TECHNICAL GRADE MOLYBDENUM OXIDE

Michael A. Vertes, Weston, Conn., and Richard A. Ronzio, Golden, Colo., assignors to Amax Inc., New York, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,290
Int. Cl.² C01G 39/00
U.S. Cl. 423—56 5 Claims



1. A process for purifying molybdenum trioxide which comprises the steps of providing an impure particulated molybdenum trioxide feed material of a particle size less than about 100 mesh, mixing feed material with sulfuric acid in an amount sufficient to provide a stoichiometric excess of sulfuric acid relative to the metallic impurities present in said feed material to form a reaction mixture, agglomerating said reaction mixture into pellets, heating said pellets to a temperature up to about 250°C for a period of time sufficient to effect a baking thereof, heating the baked said pellets to an elevated temperature of from 400°C up to about 600°C in air to effect a roasting thereof and to cause a reaction to occur between the metallic impurities in said feed material and the sulfuric acid to form aqueous soluble sulfate compounds, pulverizing the roasted said pellets into a powder of an average particle size less than about 100 mesh, leaching the said powder with hot water at a temperature above about 50°C to extract the sulfate compounds therefrom, separating the leached said powder from the resultant hot water leaching solution, contacting the leached said poweder with an aqueous ammoniacal leach solution to extract the molybdenum trioxide constituent therein forming a solution containing ammonium molybdate and an insoluble residue, separating said solution containing ammonium molybdate from said residue and recovering the ammonium dimolybdate constituent from said solution.

3,932,581

METHOD OF SEPARATING COBALT (II) AND NICKEL (II) BY EXTRACTION

Raimo Juhani Leimala, Harjavalta, Finland, assignor to Outokumpu Oy, Outokumpu, Finland

Filed May 6, 1974, Ser. No. 467,096
Claims priority, application Finland, May 22, 1973, 1653/73
Int. Cl.² C01G 51/00, 53/00
U.S. Cl. 423—139 9 Claims

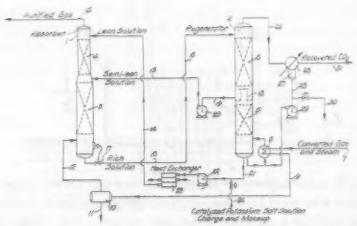
1. A method of separating cobalt (II) and nickel (II) by extraction, whereby an aqueous solution containing ions of these metals is mixed with an extraction agent containing an organic phosphoric acid and the pH during the extraction is kept within the range 4–7, after extraction the phases are separated from each other, and the extraction agent is regenerated to recover the cobalt, wherein at least 5 g/l of a water-soluble magnesium compound is added to the solution before the extraction.

3,932,582

METHOD AND COMPOSITIONS FOR REMOVING ACID GASES FROM GASEOUS MIXTURES AND REDUCING CORROSION OF FERROUS SURFACE AREAS IN GAS PURIFICATION SYSTEMS

Allen G. Eickmeyer, 8126 El Monte, Prairie Village, Kans. 66208

Continuation of Ser. No. 398,066, Sept. 17, 1973, which is a continuation of Ser. No. 22,505, March 25, 1970, abandoned, which is a continuation-in-part of Ser. No. 523,926, Feb. 1, 1966, abandoned, and a continuation-in-part of Ser. No. 432,334, Feb. 12, 1965, abandoned, which is a continuation-in-part of Ser. No. 291,532, June 28, 1963, abandoned, which is a continuation-in-part of Ser. No. 231,963, Oct. 22, 1962, abandoned, which is a continuation-in-part of Ser. No. 209,221, July 11, 1962, abandoned. This application Nov. 14, 1974, Ser. No. 523,735
Int. Cl.² B01D 53/34
U.S. Cl. 423—223 4 Claims



1. In an absorption-desorption process for removing carbon dioxide from a gaseous mixture containing essentially no hydrogen sulfide and oxygen, wherein the gaseous mixture is contacted with an aqueous alkali metal borate absorption

solution, the latter thereafter being regenerated by removing at least a portion of the absorbed carbon dioxide and thence recycled for further absorptive contact, the improvement which comprises introducing an oxidizing agent for contact with said solution in sufficient quantities to retard corrosion of ferrous surfaces in contact with the solution.

3,932,583

METHOD OF REMOVING HYDROGEN SULFIDE FROM A GAS CONTAINING CARBON DIOXIDE

Vernon Hugo Schievelbein, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 263,911, June 19, 1972, abandoned. This application Apr. 22, 1974, Ser. No. 462,907

Int. Cl.² B01D *53/34*

U.S. Cl. 423—232 16 Claims

1. A process for preferentially removing hdyrogen sulfide from a gas mixture comprising hydrogen sulfide and carbon dioxide and converting the hydrogen sulfide to elemental sulfur comprising

treating said gas mixture at atmospheric pressure with an aqueous solution consisting of inert salts, dissolved bicarbonate ions in sufficient concentration to establish an equilibrium imbalance to prevent substantial dissolution of carbon dioxide, a catalytic quantity of ions of a transition metal and dissolved oxygen in an amount sufficient to stoichiometrically convert all of the hydrogen sulfide to elemental sulfur.

3,932,584

METHOD FOR PURIFYING HYDROGEN SULFIDE-CONTAINING GAS

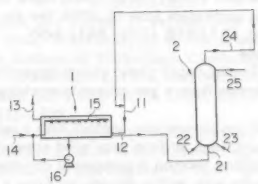
Tokuzo Asakusa; Taketoshi Honma; Isao Hirashita; Koichi Yasui; Yoshio Nishi, and Koichi Murayama, all of Nobeoka-shi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Jan. 25, 1974, Ser. No. 436,721

Claims priority, application Japan, Feb. 2, 1973, 48-12901

Int. Cl.² C01B *17/16*

U.S. Cl. 423—234 8 Claims



1. A method for purifying hydrogen sulfide-containing gas which comprises a first step of absorbing a hydrogen sulfide-containing gas in an aqueous solution of sodium hydroxide and/or sodium sulfide to obtain a solution containing sodium hydrosulfide, and a second step of introducing sulfuric acid and sulfur dioxide gas simultaneously into said aqueous solution after absorption while maintaining a reaction temperature of 5°–70°C and a pH of 1–6 to form sodium sulfate and to deposit sulfur.

3,932,585

METHOD OF REMOVING NITROGEN OXIDES FROM PLANT EXHAUST

Sanseki Moriguchi; Hiroshi Abe; Kiyoshi Saito, and Makoto Miyazawa, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 6, 1973, Ser. No. 394,680

Claims priority, application Japan, Sept. 12, 1972, 47-91399

Int. Cl.² C01C *3/00*

U.S. Cl. 423—235 9 Claims

1. A method of removing a nitrogen oxide from an exhaust gas containing a nitrogen oxide, which comprises: contacting said gas with an acidic aqueous solution consisting essentially of

i. a salt selected from the group consisting of ammonium sulfite, ammonium acid sulfite, an alkali metal sulfite, an alkali metal acid sulfite, an alkaline earth metal sulfite, an alkaline earth metal acid sulfite, and a mixture of two or more thereof,

ii. at least one copper compound forming divalent copper ions therein, the amount of said copper compound in said solution being such that divalent copper ions are produced in an amount of from 0.01 to 0.1 percent by weight in said solution, and

iii. at least one manganese compound forming divalent manganese ions therein, the amount of said manganese compound being such that divalent manganese ions are produced in an amount of from 0.01 to 0.1 percent by weight in said solution,

to reduce said nitrogen oxide to nitrogen gas.

3,932,586

REMOVAL OF OXIDES OF SULFUR FROM GASES

Salvatore A. Guerrieri, Newark, Del., assignor to The University of Delaware, Newark, Del.

Filed Oct. 12, 1973, Ser. No. 405,757

Int. Cl.² C01B *17/00*

U.S. Cl. 423—242 9 Claims

1. A process for removing sulfur dioxide from gases which includes;

a. contacting said gases and absorbing sulfur dioxide therefrom with an aqueous solution containing potassium carbonate to derive a solution which includes potassium sulfite as well as potassium carbonate and withdrawing said derived solution,

b. returning to step (a) a portion of said derived solution from step (a),

c. introducing lithium carbonate granules into another portion of said derived solution from step (a) to form with said solution a slurry mixture wherein the molar ratio of lithium to potassium is between 42/58 and 62/38,

d. passing said mixture through a first heating zone under pressure and dispersing it into a second heating zone under pressure where water is evaporated and solids are melted, producing a smelt,

e. superheating a portion of said smelt by passing it through a third heating zone, dispersing said superheating smelt into the said second heating zone where it supplies the heat needed to evaporate water and to melt the solids of the incoming mixture,

f. passing another portion of said smelt through a fourth heating zone and then into a first reaction zone wherein, by contact with hydrogen, the oxygenated sulfur compounds in the smelt are reduced to sulfides,

g. transferring the sulfide containing smelt to a second reaction zone wherein, by contact with a mixture of carbon dioxide gas and water vapor, said sulfides react with said gases to produce a smelt including potassium carbonate and lithium carbonate and a gas including hydrogen sulfide,

h. transferring a portion of said smelt from step (g) to the second heating zone,

aqueous mixing another portion of the said smelt from step (g) with water at elevated temperature to produce an anqueous solution of potassium carbonate and a residue of lithium carbonate, separating said lithium carbonate from said solution of potassium carbonate transferring said lithium carbonate to step (c), and transferring said aqueous solution of potassium carbonate to step (a).

3,932,587

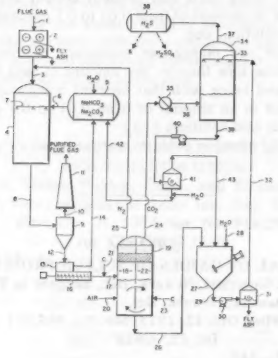
ABSORPTION OF SULFUR OXIDES FROM FLUE GAS

LeRoy F. Grantham, Calabasas; Dennis C. Gehri, Granada Hills, and Bruno Katz, Encino, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 206,382, Dec. 9, 1971, abandoned. This application Oct. 26, 1972, Ser. No. 300,925

Int. Cl.² C01B *17/00*

U.S. Cl. 423—242 **7 Claims**



1. A closed-cycle process capable of removing in a single spray-drying step at least 90% of a sulfur oxide impurity from a hot waste gas comprising the steps of:

contacting the hot sulfur oxide-containing waste gas at a temperature of at least 90°C in a single spray-drying step with an aqueous scrubbing medium containing between 2 and 40 wt.% of an absorbent selected from the group consisting of alkali metal carbonate, alkali metal bicarbonate, and mixtures of alkali metal carbonate and bicarbonate to form alkali metal sufate and sulfite,

recovering the resultant reaction product as a flowable, dry powder mixture not requiring further drying, said mixture containing from 20 to 85 wt.% alkali metal sulfite and sulfate and from 15 to 80 wt.% alkali metal carbonate and bicarbonate,

reacting said mixture in the molten state with a carbonaceous reducing agent under reducing conditions to convert sulfite and sulfate to sulfide while supplying a controlled amount of a source of gaseous oxygen to the reaction to provide internal heat generation to melt the mixture and maintain it in the molten state.

recovering a molten reaction product of alkali metal sulfide and carbonate,

dissolving this reaction product in water to form an aqueous solution, and

reacting said aqueous solution with a carbon dioxide-yielding material to form hydrogen sulfide gas as a recoverable product and regenerate alkali metal bicarbonate and carbonate for recirculation in the process.

3,932,588

AMMONIUM CARBONATES AS COLD-END ADDITIVES TO A DESULFURIZATION PROCESS

Bruce L. Libutti, Bethayres, and Richard J. Neddenriep, Doylestown, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Nov. 5, 1973, Ser. No. 413,122

Int. Cl.² B01J *8/00*; C01B *17/00*

U.S. Cl. 423—244 **8 Claims**

1. A method of reducing the amount of sulfur trioxide condensation on, and therefore the amount of sulfuric acid corrosion of, metal parts in contact with flue gases derived from the combustion of sulfur containing fuels which flue gases flow along a path at the cold-end of the combustion system from a first point of turbulence to a second point at which the turbulence subsides, said method comprising:

a. adding to the flue gases at the cold-end of the combustion system and at the point of turbulence a particulate ammonium carbonate compound, and

b. permitting the particulate carbonate compound to flow with the flue gases at least from the point of turbulence to the second point such that the particles deposit on the surfaces of the metal parts, wherein the carbonate compound is added to the flue gases in an amount from about 0.01 to 0.8 pound of the carbonate compound per pound of sulfur trioxide generated and wherein the carbonate compound has a particle size of 360 microns or less.

3,932,589

SELECTIVE CHROMATOGRAPHIC SEPARATION OF SULFUR DIOXIDE WITH ORGANIC REAGENTS

Aaron J. Teller, Great Neck, N.Y., assignor to Teller Environmental Systems, Inc., Worcester, Mass.

Division of Ser. No. 156,952, June 25, 1971, Pat. No. 3,859,417, which is a continuation of Ser. No. 860,665, Sept. 24, 1969, abandoned, which is a continuation-in-part of Ser. No. 667,801, Sept. 14, 1967, abandoned, which is a continuation-in-part of Ser. No. 363,403, April 29, 1964, abandoned. This application June 14, 1974, Ser. No. 479,215

Int. Cl.² C01B *17/00*; B01J *8/00*

U.S. Cl. 423—244 **6 Claims**

1. A process for the vapor phase chromatographic separation of sulfur dioxide from a gas stream comprising the steps of:

a. passing said gas stream into contact with a substantially dry absorbent, high surface area solid support material having deposited thereon a compound capable of reacting chemically with sulfur dioxide to form a thermally decomposible molecule and thereby removing sulfur dioxide from the gas stream, said compound being selected from the group consisting of phenols and quinones; and,

b. recovering said gas stream substantially free of sulfur dioxide by removing it from contact with the support material and the thermally decomposible molecule deposited thereon

c. regenerating said compound for reuse by raising the temperature of said support material and the thermally decomposible molecule deposited thereon to a temperature above the decomposition temperature of said molecule until substantially all of the sulfur dioxide is driven off and recovered.

3,932,590
PROCESS FOR PREPARING MEDIUM DENSITY GRANULAR SODIUM TRIPOLYPHOSPHATE

Raimond Pals, Farmingdale; Robert J. Fuchs, Clark, both of N.J., and John C. Schwartz, Green River, Wyo., assignors to FMC Corporation, Philadelphia, Pa.

Filed Apr. 8, 1974, Ser. No. 459,256
Int. Cl.² C01B *15/16, 25/26*
U.S. Cl. 423—315 11 Claims

1. A method of preparing granular sodium tripolyphosphate of medium density which comprises spraying onto rotating finely divided sodium tripolyphosphate particles having a size distribution of at least 50% by weight −100 mesh, 0 to 25% by weight −50+100 mesh and 0 to 25% by weight +50 mesh, an aqueous spray solution of sodium orthophosphate having a concentration of from about 20 to 65% by weight until the total amount of dissolved solids sprayed is between 8 and 15% by weight based on the total weight of sodium tripolyphosphate to be produced, to form an agglomerated product and calcining the agglomerated product at a temperature of 300° to 600°C to produce granular sodium tripolyphosphate having a bulk density between about 0.50 and 0.80 grams per cubic centimeter and a particle size of −20+100 mesh.

3,932,591
PROCESS FOR THE MANUFACTURE OF PHOSPHORIC ACID WITH MINIMIZED ENVIRONMENTAL EFFECTS

Rogelio Serge Ribas, Decatur, and John D. Nickerson, Atlanta, both of Ga., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 19, 1972, Ser. No. 245,336
Int. Cl.² C01B *25/16*
U.S. Cl. 423—319 5 Claims

1. In a process for producing phosphoric acid wherein phosphate rock is mined, beneficiated, the beneficiated product separated into a slimes stream, one or more pebble streams, and a concentrate stream, the slimes stream discarded, and the pebble streams digested with mineral acid and filtered to remove impurities, the improvement comprising dewatering the slimes stream to a solids content of at least 40 percent by weight, calcining the dewatered slimes at a temperature in the range of 1600° to 2200°F, combining the calcined slimes with the beneficiated pebble prior to digesting with a mineral acid and filtering the resultant slurry to remove solid matter.

3,932,592
PROCESS FOR PREPARING CATHODOCHROMIC SODALITE

Lee T. Todd, Jr.; Eugene F. Farrell, both of Lexington, and Arthur Linz, Winchester, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 1, 1974, Ser. No. 456,962
Int. Cl.² C01B *33/26, 33/28;* C09K *11/08*
U.S. Cl. 423—328 19 Claims

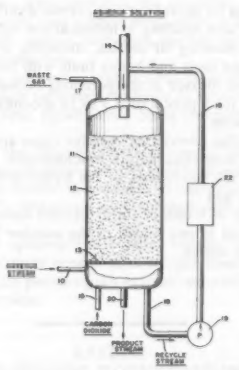
1. A process for preparing cathodochromic sodalite consisting essentially of sodalite of the formula $Na_6Al_6Si_6O_{24} \cdot 2(1-z)$ NaX, wherein z is the fraction of NaX vacancies and X is taken from the group consisting of chlorine, bromine, iodine, OH and mixtures thereof, that comprises: mixing essentially stoichiometric quantities of sodium hydroxide, sodium halide, aluminum oxide and silicon dioxide to form a charge; placing the charge in a hydrothermal pressure vessel having a lower or dissolving zone and an upper or growth zone; adding to the charge water and further sodium hydroxide to provide an excess of sodium hydroxide in the charge; applying heat to the vessel and maintaining the temperature of the charge therein between 300°C and 500°C, the lower or dissolving zone of the vessel being at least 10°C higher in temperature than the upper or growth zone of the vessel, the 300°C to 500°C temperature being maintained for at least the order to 20 hours; cooling the vessel to room temperature and removing from the vessel the material which is in a crystallized powder form in a concentrated sodium hydroxide solution and contains a sodalite phase and unwanted phases; hydrothermally re-crystallizing the powder in a hydrothermal vessel at a temperature of at least 80°C for the order of 3 days to convert the unwanted phases to the sodalite phase and provide a resulting powder that is high in sodalite; and annealing the resulting powder in hydrogen between 550°C and 950°C for 15 minutes to an hour.

9. A process for preparing cathodochromic sodalite consisting essentially of sodalite of the formula $Na_6Al_6Si_6O_{24} \cdot 2(1-z)$ NaX, wherein z is the fraction of NaX vacancies and X taken from the group consisting of chlorine, bromine, iodine, OH and mixtures thereof, that comprises: mixing quantities of sodium hydroxide, sodium halide, aluminum oxide and silicon dioxide to form a charge; comminuting the charge; sintering the commimuted charge to form a crystalline material containing a sodalite phase and at least one unwanted phase; comminuting the sintered product to form a powder; hydrothermally transforming the powder at a temperature sufficiently high and a growth period sufficiently long to effect re-crystallization of at least some of said at least one unwanted phase to increase the sodalite phase in the powder; and annealing the resulting powder in hydrogen between 550°C and 950°C for at least 15 minutes to an hour.

3,932,593
PROCESS FOR THE SYNTHESIS OF AMMONIUM NITRITE

John H. Bonfield, Basking Ridge, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed May 11, 1973, Ser. No. 359,292
Int. Cl.² C01B *21/20*
U.S. Cl. 423—385 7 Claims



1. In a process for producing ammonium nitrite by contacting in a reaction zone a gaseous stream comprising at least, in part, nitric oxide and molecular oxygen-containing gas with an aqueous solution having a pH of at least about 6.75 and containing a basically reacting ammonium compound, the improvement which comprises introducing into said reaction zone free carbon dioxide in an amount of from about 15 to 30 volume percent carbon dioxide of said gaseous stream.

3,932,594

PROCESS FOR THE PREPARATION OF FINE GRAIN METAL CARBIDE POWDERS

Frank P. Gortsema, Croton, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,269
Int. Cl.² C01B *31/30, 31/34*
U.S. Cl. 423—440 8 Claims

1. A process for producing finely divided metal carbide powders which comprises the steps of

a. impregnating a carbohydrate material with a compound of a metal, said metal being selected from the group consisting of tungsten, titanium, tantalum, molybdenum, zirconium, hafnium, thorium, or mixtures thereof;

b. igniting the impregnated material product of step (a) at a temperature which does not exceed the temperature at which sintering occurs, to produce fragile agglomerates of sub-micron size metal oxide particles;

c. comminuting the metal oxide product of step (b) to produce finely divided metal oxide powder having a mean particle size below micron; and

d. heating said metal oxide powder in an atmosphere of methane and hydrogen to convert said metal oxide powder to metal carbide powder.

3,932,595

PROCESS OF MANUFACTURING CARBON BISULFIDE

Jean Berthoux, Decines, and Ghislain Schwachhofer, Miribel, both of France, assignors to Rhone-Progil, Paris, France

Continuation of Ser. No. 251,980, May 10, 1972, abandoned.
This application June 7, 1974, Ser. No. 477,340
Claims priority, application France, May 19, 1971, 71.7119
Int. Cl.² C01B *31/26*
U.S. Cl. 423—443 6 Claims

1. A process for manufacturing carbon disulfide comprising contacting and reacting a hydrocarbon selected from the group consisting of olefins, diolefins, cyclic hydrocarbons, light fuels and heavy fuels with both sulfur vapor and sulfur dioxide at temperatures between about 500°–1000°C. for a period of 0.3 to 10 seconds in the absence of a catalyst,

the total sulfur introduced as sulfur vapor and sulfur dioxide being at least equal to the stoichiometric quantity necessary for the conversion of the hydrocarbon into carbon disulfide and

the number of moles of sulfur dioxide introduced being at least equal to one fourth of the number of hydrocarbon hydrogen atoms.

3,932,596

METHOD FOR SEPARATING AND RECOVERING KISH GRAPHITE FROM MIXTURES OF KISH GRAPHITE AND FUME

Pradeep Kumar Rohatgi, Bangalore, India, assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 271,443, July 13, 1972, abandoned. This application Apr. 23, 1974, Ser. No. 463,349
Int. Cl.² C01B *31/02, 31/04*
U.S. Cl. 423—448 22 Claims

1. An improved method for separating kish graphite from kish graphite and fume mixtures and recovering the kish graphite as a clean product comprising:

a. screening the kish graphite and fume mixture to obtain a screen overflow consisting essentially of kish graphite with fume adhering to the surfaces thereof and a screen underflow consisting essentially of fume, said screen underflow being passed to waste,

b. mixing the screen overflow with at least one washing agent taken from the group consisting of water, hydrochloric acid and waste hydrochloric acid pickle liquor,

c. adding a quantity of at least one surface active agent taken from the group consisting of a water soluble non-ionic compound and a water soluble cationic compound, where said water soluble non-ionic compound is the condensation product of the reaction between two mols of diethanolamine and one mol of at least one fatty acid taken from the group consisting of lauric acid, myristic acid, myristoleic acid, palmitoleic acid, oleic acid and coconut acids and a compound formed by the addition of ethylene oxide to a linear alcohol having a carbon chain length of about C_{11} to about C_{18} and said water soluble cationic compound is a quaternary ammonium salt, to the mix of step (b),

d. agitating the mixture formed in step (c) for a time to substantially completely wet the surfaces of the kish graphite,

e. filtering the agitated mixture of step (d) to separate the kish graphite from the fume washing agent and surface active agent, said kish graphite being collected as a filter cake and the fume, washing agent and surface active agent as an effluent which is passed to waste,

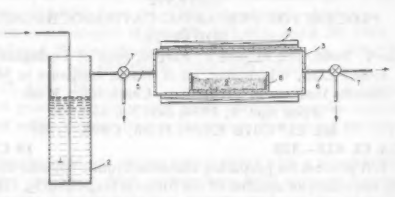
f. washing and drying the kish graphite recovered in step (e) as filter cake.

3,932,597

PURIFICATION OF ALKALI METAL HALIDES

Ricardo C. Pastor, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 416,899, Nov. 19, 1973, abandoned.
This application June 17, 1975, Ser. No. 587,746
Int. Cl.² C01D *3/20, 3/04, 3/10, 3/12*
U.S. Cl. 423—499 4 Claims



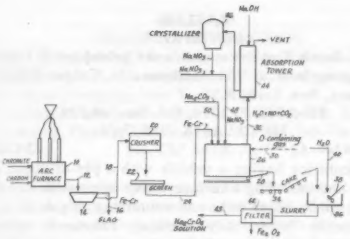
1. A method for upgrading the purity of alkali metal chlorides, bromides, and iodides for use as laser crystal starting materials by removing cation and anion impurities comprising the steps of placing the metal halide in a reaction chamber, heating said halide to its molten state, exposing said metal halide to halide-source species in the vapor phase which yields by dissociation a nascent halogen corresponding to the metal halide being treated from 5 to 20 hours and allowing the purified material to cool to its solidification temperature in the presence of said nascent halogen.

3,932,598

PROCESS FOR PRODUCING ALKALI METAL CHROMATES AND DICHROMATES

Hugh S. Cooper, deceased, late of Shaker Heights, Ohio, by Henry J. Rand, executor, 25801 Lake Shore Blvd., Euclid, Ohio 44132

Filed Apr. 24, 1970, Ser. No. 31,528
Int. Cl.² C01G 37/14
U.S. Cl. 423—596 19 Claims



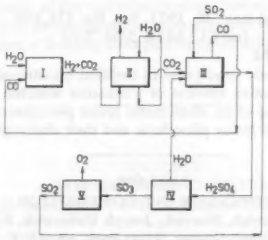
1. A process for producing alkali metal chromates comprising slowly adding a finely divided ferrochrome alloy containing 1% to 10% by weight carbon wherein the ferrochrome alloy is suspended in an oxygen-containing gas and sprayed onto the surface of a molten mixture comprising an alkali metal nitrate and an alkali metal carbonate wherein the alkali metal carbonate constitutes between 2–15% by weight of the mixture at a temperature of 350°C to 900°C, and separating the alkali metal chromate produced.

3,932,599

METHOD OF OBTAINING HYDROGEN FROM STEAM

Rudolf Schulten, Richterich; Johannes Teggers, Wesseling, and Roland Schulze Bentrop, Bonn, all of Germany, assignors to Rheinische Braunkohlenwerke Aktiengesellschaft, Cologne, Germany

Filed Feb. 25, 1975, Ser. No. 552,828
Claims priority, application Germany, Mar. 1, 1974, 2409762
Int. Cl.² C01B 1/02, 1/08, 13/02
U.S. Cl. 423—655 1 Claim



1. A method of obtaining hydrogen from steam in a multistage circulatory process, in which in a first reaction stage carbon monoxide is reacted catalytically with steam at a temperature of 300° to 500°C to produce carbon dioxide and hydrogen; and in a second reaction stage the carbon dioxide is reacted with water and sulphur dioxide at a temperature of 100° to 650°C and at a pressure of 20 to 750 atmospheres to produce sulfuric acid and carbon monoxide; the sulfuric acid through an intermediate stage of conversion to sulfur trioxide is dissociated into sulphur dioxide, oxygen and steam by heat treatment; the carbon monoxide which has been obtained is recycled back into the first reaction stage, and the sulphur dioxide which has been obtained is recycled back into the second reaction stage; and the hydrogen and oxygen obtained as end products are separately recovered.

3,932,600

PROCESS FOR THE GENERATION OF HYDROGEN

Heinrich Gutbier, and Karl Höhne, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 13, 1973, Ser. No. 397,009
Claims priority, application Germany, Sept. 13, 1972, 2244944
Int. Cl.² C01B 1/07, 1/02
U.S. Cl. 423—657 9 Claims

1. A process for generating gaseous hydrogen comprising reacting with water, small particles of magnesium metal or of a combination of magnesium and aluminum metal in a weight ratio of magnesium to aluminum of between 7:1 to 2:6, said particles being admixed with an oxide of cobalt selected from the group consisting of tricobalt tetraoxide (Co_3O_4) and dicobalt trioxide (Co_2O_3), said reaction occuring in the presence of a water soluble chloride selected from the group consisting of alkali metal chlorides and magnesium chloride, wherein the amount of cobalt oxide is from about 0.5 to 5.0% by weight of total metal and the amount of water-soluble chloride is from about 5% to 200% by weight of total metal.

3,932,601

METHOD AND COMPOSITION FOR THE DIAGNOSIS OF EQUINE INFECTIOUS ANEMIA VIRUS INFECTION BY USING AGAR-GEL-IMMUNODIFFUSION REACTION

Leroy Coggins, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation-in-part of Ser. No. 132,073, April 7, 1971, abandoned. This application Nov. 5, 1971, Ser. No. 196,060
Int. Cl.² A61K 39/12; G01N 31/00, 33/16
U.S. Cl. 424—12 6 Claims

1. A method for obtaining an antigen preparation of equine infectious anemia virus useful in the diagnosis of said virus infection in animals, said antigen preparation being specific in its reaction with equine infectious anemia virus antibody, which method comprises

a. inoculating an equine with a virus of equine infectious anemia having sufficient virulence to render said equine severely febrile rapidly after being inoculated with said virus;

b. removing the equine infectious anemia virus infected spleen from said equine shortly after said animal becomes febrile, but before the antigen in said spleen becomes substantially tied up or contaminated with antibodies to the antigen,

c. forming a spleenic tissue pulp, causing release of an equine infectious anemia virus antigen from the spleenic pulp, thereby providing an extract comprising said antigen preparation.

3,932,602

NON-STINGING WOUND DRESSING

Ulf Alan Sweger, Marbella, Spain, assignor to Novitas Nuprot SA, Freibourg, Switzerland

Filed Dec. 13, 1973, Ser. No. 424,422
Claims priority, application Switzerland, Dec. 27, 1972, 16962/72
Int. Cl.² A61L 9/04
U.S. Cl. 424—45 3 Claims

1. In an aerosol wound dressing of the type having in an aerosol spray container pressurized with dichlorodifluoromethane, 1,1,2-trichloro-1,2,2-trifluoroethane, or trichlorofluoromethane which contains a film forming plastic material selected from the group consisting of N-butyl methacrylate, isobutyl methacrylate, 2-ethoxyethyl methacrylate, methyl

methacrylate, 2-ethoxyethyl methacrylate/methyl methacrylate(90/10 copolymer), N-butyl methacrylate/isobutyl methacrylate(50/50 copolymer), or N-butyl methacrylate/-methyl methacrylate(80/20 copolymer) in a solvent system, the improvement which comprises a solvent system having sym-tetrachlorodifluoroethane alone or at least 50% sym-tetrachlorodifluoroethane in combination with methanol, ethanol, acetone, methyl ethyl ketone, ethyl acetate, or amyl acetate; said improvement rendering the aerosol wound dressing non-stinging.

3,932,603

ORAL PREPARATIONS FOR REDUCING THE INCIDENCE OF DENTAL CARIES

Gerhard J. Haas, Woodcliff Lake, N.J., assignor to General Foods Corporation, White Plains, N.Y.

Filed May 28, 1971, Ser. No. 148,203. The portion of the term of this patent subsequent to Mar. 13, 1991, has been disclaimed.

Int. Cl.² A61K *7/16*

U.S. Cl. 424—49 **1 Claim**

1. A method for reducing the incidence of dental caries comprising placing in the mouth an oral preparation containing from 0.002% to 0.3% by weight of an antimicrobial compound selected from the group consisting of sodium-palmitoyl-L-lysine-L-lysine ethyl ester, sodium-palmitoyl-L-lysine-L-lysine amide dihydrochloride and combinations thereof, said preparation capable of producing an effective concentration of the compound in the mouth to be antimicrobial against cariogenic streptococci.

3,932,604

HUMECTANT SWEETENER

Jordan B. Barth, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 317,696, Dec. 22, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 449,620

Int. Cl.² A61K *7/16*

U.S. Cl. 424—49 **8 Claims**

1. A dental cream requiring a humectant, said humectant consisting essentially of at least about 15% by weight of xylitol, effective, as sole humectant, to prevent orifice plugging when said cream is left uncapped overnight.

3,932,605

DENTAL TREATMENT

Jaroslav Vit, 40 Partridge Run, Belle Mead, N.J. 08502

Filed Oct. 26, 1972, Ser. No. 301,163

Claims priority, application United Kingdom, June 29, 1972, 30611/72; June 12, 1972, 27443/72; Aug. 24, 1972, 39588/72; Aug. 24, 1972, 39589/72

Int. Cl.² A61K *7/20, 7/22*

U.S. Cl. 424—51 **24 Claims**

1. A method useful in treating living unextracted teeth in the oral cavity to remove caries, to dissolve or remove plaque, to help in the prevention of calculus formation, or to remove stains thereby to brighten teeth, while leaving the dentine and enamel of healthy tooth tissue entirely unaffected consisting essentially of the step of contacting said teeth in the oral cavity with an effective amount of an N-halo compound which is a member of the group consisting of N-bromoglycine, N-iodoglycine, N-halosulfamic acid, N-halosarcosine, N-halo alpha-aminoisobutyric acid, N-halotaurine, N-halo-2-aminoethanol, N-halo-acetylglycine, N-haloalanine, N-halo betaalanine, N-haloserine, N-halo phenyl alanine, N-halo norvaline, N-haloleucine, N-halo isoleucine, N-haloproline, N-halo hydroxyproline, N-halo omega aminoundecanoic acid, N-haloaspartic acid, N-haloglutamic acid, N-haloasparagine, N-halovaline, N-halotyrosine, N-halothreonine, N-halocysteine, N-halocystine, N-halomethionine, N-haloglutamine, N-halotryptophane, N-halohistidine, N-haloarginine, N-halolysine, N-halo alpha-aminobutyric acid, N-halo gamma-aminobutyric acid, N-halo alpha, epsilon diamino pimelic acid, N-halo ornithine, N-halo hydroxyl lysine, N-haloanthranilic acid, N-halo p-aminobenzoic acid, N-halosulfanilic acid, N-halo orthanilic acid, N-halo phenyl sulfamic acid, N-haloaminopropanesulfonic acid, N-halo 2-aminopropanol, N-halo diethanolamine, N-halo ethylenediamine tetraacetic acid, N-halo nitrilotriacetic acid, N-halotaurine, N-halo aminomethane-sulfonic, N-halo glycylglycine, N-halo glycylglycylglycine, N-halo metanilic acid and N-halo-N-octodecanyl glycine, said halogen having an atomic weight of 35 to 127.

3,932,606

DENTIFRICE

Jordan B. Barth, East Brunswick, and Christopher H. Costello, Millington, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Feb. 7, 1974, Ser. No. 440,399

Int. Cl.² A61K *7/16, 7/18*

U.S. Cl. 424—52 **23 Claims**

1. A dentifrice having a vehicle with a pH of about 3 to about 10 and including a surface active agent with an otherwise potentially bitter taste and containing as sole or prime high intensity bitter taste masking sweetener approximately by weight 0.01 to 10.0% of a member selected from the group consisting of 3,4-dihydro-1,2,3-oxathiazin-4-one, the alkaline metal salts, and the alkaline earth metal salts thereof.

3,932,607

ANTIMICROBIAL COMPOSITION

Sven-Gunnar Hesselgren, Angsholmen, Drottningholm, Sweden

Filed July 26, 1973, Ser. No. 382,815

Claims priority, application Sweden, July 31, 1972, 9953/72

Int. Cl.² A61K *7/16, 27/00*

U.S. Cl. 424—52 **11 Claims**

1. An oral antibacterial composition of a pH of 7 to about 7.3 comprising as an essential active ingredient an antibacterially effective combination of (a) dodecyl-di-(aminoethyl)-glycine and (b) chlorohexidine or a salt thereof selected from the group consisting of the digluconate, the diacetate, the dichloride and the monofluorophosphate, in a suitable carrier.

3,932,608

FOOD COMPOSITION

Ray H. Anderson, Osseo, and Albert L. Saari, Minneapolis, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Aug. 30, 1971, Ser. No. 176,276

Int. Cl.² A61K *5/00, 7/16*

U.S. Cl. 424—54 **7 Claims**

1. A cariogenic food product fortified nutritionally with a cariostatic effective amount of a member selected from the group consisting of an alkali metal lysine phosphate, an alkaline earth metal lysine phosphate and their diphosphates.

3,932,609

ANTIPERSPIRANT COMPOSITION

Joseph Rosenstreich, Merrick; Joseph Gubernick, Port Washington, and Frank Garone, Kings Park, all of N.Y., assignors to Estee Lauder Inc., New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,515

Int. Cl.² A61K *7/38*

U.S. Cl. 424—68 **8 Claims**

1. A stable antiperspirant lotion composition which is particularly suitable for use in a roll-on applicator comprising from about 12 to about 20% by weight of aluminum chlorhydrate, from about 1 to about 3% by weight of aluminum chloride, from about 5 about 12% by weight of fumed silica, from about 0.1 to about 1% by weight of a quaternary ammonium salt selected from the group consisting of octyl phenoxy ethoxy ethyl dimethyl benzyl ammonium chloride and octyl

cresoxy ethoxy ethyl dimethyl benzyl ammonium chloride, a buffer material in an amount sufficient to adjust the pH of said composition to between about 3.20 and 3.50 and the remainder of the composition being water, said lotion composition being characterized by a viscosity of from about 500 to about 2,225 cps at ambient temperature.

3,932,610

SHAMPOO COMPOSITION

Jerome Rudy, Livingston; Morton Pader, Teaneck, and William Netzbandt, Dumont, all of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 205,314, Dec. 6, 1971, abandoned. This application Mar. 21, 1973, Ser. No. 343,593
Int. Cl.² A61K 7/06
U.S. Cl. 424—70 **18 Claims**

1. A foaming shampoo composition comprising (a) at least about 5 weight percent, based on the weight of the total composition of a surfactant system selected from the group consisting of anionic, nonionic and ampholytic detergent compounds, and mixtures thereof;

b. from about 10 to about 90 weight percent, based on the weight of the total composition of a solvent system, the solvent system containing at least 10 weight percent thereof of a water miscible polar organic solvent; and,

c. from about 1.0 to about 60 weight percent based on the weight of the total composition of a hair grooming agent selected from the group consisting of polymerized wood rosin, dimerized wood rosin, hydrogenated wood rosin, C_1 to C_6 esters of these rosins, sucrose acetate isobutyrate, polyvinyl ethyl ethers having a molecular weight of from about 10,000 to 750,000 alkyds having a molecular weight of from about 10,000 to about 50,000, polyketones having an average molecular weight of from about 500 to 1,000, vinylacetate, acrylic resins having an average molecular weight of from about 10,000 to 150,000, cocoamide having a melting point of 80° to 90°C, steryl amide, ethoxylated higher fatty alcohols, and mixtures thereof, the grooming agent being substantially soluble or dispersible in the solvent-surfactant systems so as to form a single phase with the solvent-surfactant system and substantially insoluble in water so that the agent will become insoluble and deposit onto the hair of the user upon dilution with water during shampooing; the relative amounts of the surfactant system, the solvent system and the hair grooming agent being adjusted within said ranges to give a foaming shampoo composition.

3,932,611

HAIR DRESSING COSMETIC

Connie M. McCarthur, 3709 Lovingood Drive, Dallas, Tex. 75241

Filed Aug. 21, 1974, Ser. No. 499,270
Int. Cl.² A61K 7/06
U.S. Cl. 424—70 **2 Claims**

1. A uniform hair and scalp care cosmetic mixture, comprised of volumetric proportional ingredients, with any one ingredient not exceeding a 15 percent volumetric variation from the specific ingredients, and percentages of total mixture volume thereof defined by and proportional to 86.808 percent white petroleum jelly, 2.129 percent beeswax, 7.011 percent olive oil, 2.631 percent castor oil, 1.316 percent coconut oil, 0.024 percent oil of sassaphras, and 0.018 percent perfuming agent; said mixture having a consistency slightly more viscous than petroleum jelly.

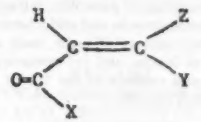
3,932,612

INSECTICIDAL COMPOSITIONS FOR SUSTAINED RELEASE OF 0,0-DIMETHYL-0-(2,2-DICHLOROVINYL) PHOSPHATE

Claus Burkhardt, Krefeld; Karl Raichle, Krefeld-Bockum, and Wolfgang Behrenz, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 15, 1973, Ser. No. 370,512
Claims priority, application Germany, June 24, 1972, 2231099
Int. Cl.² A01N 9/36
U.S. Cl. 424—78 **10 Claims**

1. A method of diminishing the initially objectionable odor of an insecticidal composition comprising 0,0-dimethyl-0-(2,2-dichlorovinyl)-phosphate, an ethylenically unsaturated polyester, a vinyl monomer copolymerizable with the polyester, and at least one solid or liquid filler, comprising incorporating in the composition prior to curing about 0.1 to 10% by weight of the composition of an ethylenically unsaturated compound of the formula



in which

X is —OR or —OH, Y is —H and Z is —COOR, or

X is —OH, Y is —COOR and Z is —H, or

X is —O— or <N—R, Y is <CO and Z is —H, in which case X and Y are bonded together to form an anhydride or imide ring, and

R is an aliphatic radical with up to 12 carbon atoms.

3,932,613

METHOD OF PREVENTING LEAKAGE FROM BODY ORIFICES WHEN UTILIZING SUPPOSITORIES AS A SOURCE OF MEDICATION

Francis B. Chapura, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Aug. 20, 1973, Ser. No. 389,462
Int. Cl.² A61K 31/74
U.S. Cl. 424—78 **1 Claim**

1. A suppository base consisting of from 91 to 95 parts of a polyethylene glycol having an average molecular weight of about 1000; three parts of a polyethylene glycol having an average molecular weight of 300; one-half part of polyoxyethylene palmitate containing about 20 oxyethylene units; and from one and one-half to five and one half parts of a member selected from the group consisting of amorphous silica and carboxyvinyl polymer resin.

3,932,614

METHOD OF LUBRICATING OR SOFTENING THE SKIN

Howard L. Scott, Philadelphia, Pa., assignor to Fabalon, Inc.; K. & W. Scott Trust; C. N. Wragg, Jr. and B. Wragg, all of Philadelphia, Pa., part interest to each

Continuation-in-part of Ser. No. 230,487, Feb. 2, 1972, abandoned. This application Oct. 21, 1974, Ser. No. 516,817
Int. Cl.² A61K 7/00, 7/025, 7/035, 31/74
U.S. Cl. 424—78 **2 Claims**

1. A method of lubricating or softening the skin which comprises applying to the skin a composition comprising water, carboxypolymethylene and about 1 to about 50% by weight of a lubricating agent selected from the group consisting of chlorotrifluoroethylene resin, the homopolymer of tetrafluoroethylene, the homopolymer of hexafluoropropylene, and the copolymer of tetrafluoroethylene and hexafluoropropylene having the formula $(CF_3CF_2\text{-}CF_2CFCF_3)_n$ where n is an integer corresponding to the number of repeating units in the copolymerized chain, said lubricating agent having a particle size of between about 0.01 to about 30 microns and said composition having a pH of about 7–8.1.

3,932,615

PROCESS FOR THE PREPARATION OF GRANULES

Shojiro Ito, Ebina; Akira Takami, Atsugi, and Tokio Takekoshi, Machida, all of Japan, assignors to Meiji Seika Co., Ltd., Japan

Filed Mar. 8, 1974, Ser. No. 449,445
Claims priority, application Japan, Mar. 16, 1974, 48-30073
Int. Cl.[2] A61K *31/00*
U.S. Cl. 424—80 9 Claims

1. Process for the preparation of granular product of uniform particle size, good disintegrating properties, relatively great apparent density and abrasion resistance, which comprises the steps of: (a) mixing a crystalline sugar and a finely powdered basis having a particle size of from about 177μ to about 500μ in a mixing apparatus in the presence of about 15% by weight based on the total combined weight of said sugar and said basis of a solution containing from about 0.1 to 3.0% by weight of binder based on the same total combined weight, said basis comprising at least one member selected from the group consisting of penicillin, tetracycline, novobiocin, kanamycin, paromomycin and midecamycin; (b) crushing the resultant wetted mixture of sugar, basis and binder solution in the form of lumps; and (c) removing the remaining solvent from the said solution of the binder, and recovering the granular product therefrom.

3,932,616

INSECT ATTRACTANT COMPOSITION

Otto Meresz, 8 Wallingford Road, and Cecilia Mozsgai, 10 Sunny Glenway, No. 103, both of Don Mills, Ontario, Canada

Filed June 11, 1973, Ser. No. 368,960
Claims priority, application United Kingdom, June 26, 1972, 29835/72
Int. Cl.[2] A01N *17/14*
U.S. Cl. 424—84 1 Claim

1. A pheromonal composition comprising an effective amount of a mixture of cis-9-tricosene and cis-9-heneicosene, the relative amounts thereof being about 70 parts by weight cis-9-tricosene and about 30 parts by weight cis-9-heneicosene.

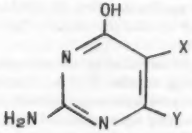
3,932,617

INTERFERON INDUCTION

Francis Richard Nichol, Jr., Newport Beach, Calif., and Gerald E. Underwood, Kalamazoo County, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed May 24, 1974, Ser. No. 473,012
Int. Cl.[2] A61K *31/505*
U.S. Cl. 424—85 12 Claims

1. A method for inducing interferon formation in humans or interferon producing animals which comprises administering to said human or animal an amount effective to induce interferon formation in said human or animal of a compound selected from the group consisting of compounds having the formula:



wherein X is a member selected from the group consisting of bromo and iodo and Y is a member selected from the group consisting of methyl and ethyl when X is bromo; or Y is a member selected from the group consisting of methyl, ethyl, n-propyl, benzyl and chloro when X is iodo; or the pharmacologically acceptable acid addition salts thereof.

3,932,618

ANTI-INFLAMMATORY COMPOSITIONS

Setsuro Fujii, Tokushima; Masatomi Otsuka, Naruto, and Yoshiyasu Osaki, Tokushima, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Japan

Filed Apr. 14, 1972, Ser. No. 244,256
Claims priority, application Japan, Apr. 14, 1971, 46-24004
Int. Cl.[2] A61K *35/14, 37/48*
U.S. Cl. 424—94 8 Claims

1. An anti-inflammatory composition which comprises an anti-inflammatorily effective amount of a reaction product of blood serum of cow with a protease obtained from Bacillus sp 0–20, deposit number FERM 270, and an adjuvant, said reaction product being obtained by reacting the serum with the protease at 20 to 60°C for about 0.5 – 5 hours and separating the resultant product from the reaction mixture, and in which said protease is used in an amount ranging from 200 to 2,000γ per ml of the blood serum.

3,932,619

METABOLITE A-27106 AND PROCESSES FOR ITS PREPARATION AND USE

Donald R. Brannon, Pittsboro, and Donald R. Horton, Brownsburg, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 328,586, Feb. 1, 1973, abandoned. This application May 24, 1974, Ser. No. 473,016
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—120 3 Claims

1. Metabolite A-27106, or the sodium, lithium, potassium, rubidium cesium or ammonium salt thereof, which metabolite is a white solid having a molecular weight of about 832 and a titratable group with a pKa value of 7.2; and the sodium salt of which is a white crystalline solid; relatively soluble in lower alkanol, but generally insoluble in lower alkane and which has:

a. a molecular weight of 854, as determined by mass spectrometry;
b. an approximate elemental composition of 58.78% carbon, 8.51% hydrogen, 27.85% oxygen, and 3.63% sodium;
c. an empirical formula of $C_{43}H_{71}O_{16}Na$;
d. an infrared absorption spectrum in chloroform as shown in the accompanying drawing;
e. a mass spectrum which shows a molecular-ion peak at m/e 854.44630 and characteristic peaks at m/e 836.44129, 779.44690, 761.44740; and
f. an Rf value of 0.49 on silica-gel thin-layer chromatography in benzene-methanol (7:3).

3,932,620

KETONES AND KETOXIMES DERIVED FROM ACID S, AN ANTIBIOTIC PRODUCED BY *POLYANGIUM CELLULOSUM* VAR. *FULVUM*

David T. Connor, Parsippany; Samuel M. Ringel, Rockaway, and Maximilian von Strandtmann, Rockaway Township, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed June 24, 1974, Ser. No. 482,052
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—122 6 Claims

1. An antifungal substance, ketodiol S, prepared by treating triol S (1 equivalent) with silver carbonate-on-celite (60 equivalents) in refluxing toluene (500 equivalents) for 1 hour and having the following characteristics:

a. Infrared Spectrum ν_{max} 3450, 1720, 1670, 1450, 1380, 1270, 1120, 1070 and 980 cm^{-1};
b. Molecular Formula $C_{28}H_{42}O_8$; molecular weight 458.

3,932,621

TRIOLS AND ACETATES THEREOF DERIVED FROM ANTIBIOTIC SUBSTANCE, ACID S, PRODUCED BY *POLYANGIUM CELLULOSUM* VAR. *FULVUM*

David T. Connor, Parsippany, and Samuel M. Ringel, Rockaway, assignors to Max von Strandtmann, Rockaway Township, all of, N.J. and Warner-Lambert Company, Morris Plains, N.J.

Filed June 24, 1974, Ser. No. 482,054
Int. Cl.² A61K *35/00*
U.S. Cl. 424—122 7 Claims

1. An antifungal substance, triol S, prepared by treating acid S (1 equivalent) with lithium aluminum hydride (10 equivalents) in the presence of boiling tetrahydrofuran (200 equivalents) for 3 hours and having the following physical properties:

a. Mass spectrum m/e (relative intensity) 460(6), 442 (5), 431 (52), 365 (6), 347 (26), 329 (10), 195 (75). 193 (100), 167 (off scale) and 165 (off scale); molecular ion observed: 460.3223; calculated for $C_{28}H_{44}O_5$: 460,3189;

b. Infrared Spectrum ν_{max} 3300, 1440, 1350, 1050, 1010 and 950 cm^{-1}.

3,932,622

SKIN MOISTURIZER

Herman H. Friedman, Bayside; Linda K. Halik, Ossining, both of N.Y., and Milton H. Schwarz, Westport, Conn., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jan. 11, 1974, Ser. No. 432,722
Int. Cl.² A61K *31/195, 31/00, 7/00*
U.S. Cl. 424—168 9 Claims

1. A moisturizing cosmetic composition which comprises a stable water-in-oil emulsion and an amount of a di-sodium or di-potassium salt of N-acetylglutamic acid which is effective to provide a super-moisturizing effect when applied to the skin.

3,932,623

METHOD OF TREATING SCHIZOPHRENIA

Ian C. Wilson, c/o Dorothea Dix Hospital, Raleigh, N.C. 27601

Filed June 18, 1974, Ser. No. 480,546
Int. Cl.² A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 1 Claim

1. A method for the treatment of a patient suffering from schizophrenia which comprises the administration to the said patient of a therapeutically effective amount of TRH or L-pyroglutamyl-L-histidyl-L-proline amide.

3,932,624

METHOD FOR PROLONGING THE INHIBITORY EFFECT OF SARALASIN ON ANGIOTENSIN II

Robert W. Fulton, Hamilton, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed June 17, 1974, Ser. No. 479,829
Int. Cl.² A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 1 Claim

1. The method of prolonging the antihypertensive effect of saralasin to angiotensin II in animals which consists in administering subcutaneously to angiotensin II hypertensive animals a composition consisting of saralasin in a 15% gelatin gel in an amount to deliver a dose of saralasin of about 5 mg/kg.

3,932,625

METHOD AND COMPOUND FOR PARASITE CONTROL

Roy L. Whistler, West Lafayette, Ind., assignor to Purdue Research Foundation, Lafayette, Ind.

Filed Mar. 25, 1974, Ser. No. 454,259
Int. Cl.² A01N *9/00*
U.S. Cl. 424—180 7 Claims

1. A method for parasite control which consists essentially of administering to a recipient in which parasites are living at least an effective amount of 5-Thio-D-glucose over a period of time to at least control said parasites.

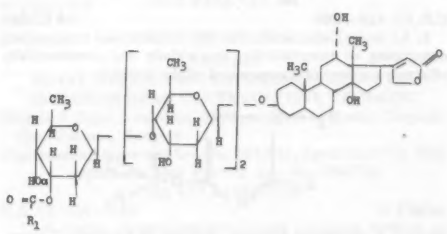
3,932,626

PHARMACEUTICAL COMPOSITIONS CONTAINING A CARBOXYLIC ACYL DERIVATIVE OF DIGOXIN AND METHOD OF USE

Walter Losel; Herbert Merz, both of Ingelheim am Rhein; Wolfgang Hoefke, Budenheim, and Werner Traunecker, Munster-Sarmsheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Division of Ser. No. 215,666, Jan. 5, 1972. This application Jan. 16, 1974, Ser. No. 433,663
Claims priority, application Germany, Jan. 14, 1971, 2101595
Int. Cl.² A61K *31/705*
U.S. Cl. 424—182 13 Claims

1. A pharmaceutical dosage unit composition for increasing the strength of the heart muscle contraction in a warm-blooded animal, consisting essentially of an inert pharmaceutical carrier and an effective amount of a compound of the formula



wherein R_1 is alkyl of 2 to 12 carbon atoms, chloro-(alkyl of 1 to 4 carbon atoms), phenyl-(alkyl of 1 to 4 carbon atoms), cycloalkyl of 5 to 6 carbon atoms(alkyl of 1 to 4 carbon atoms) or cycloalkyl of 3 to 8 carbon atoms.

3,932,627

SIVER-HEPARIN-ALLANTOIN COMPLEX

Harry W. Margraf, Clayton, Mo., assignor to Rescue Products, Inc., Bridgeton, Mo.

Filed Feb. 4, 1974, Ser. No. 439,314
Int. Cl.² A61K *31/725*; C08B *37/10*
U.S. Cl. 424—183 3 Claims

1. A non-thrombogenic and anti-microbial complex for application to body contact polymeric devices consisting essentially of silver-heparin-allantoinate.

3,932,628

EXTRACTS FROM ACTIVE TREE SAPS

Monie S. Hudson, San Jose, Costa Rica, assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Continuation-in-part of Ser. No. 837,861, June 30, 1969, abandoned, and a continuation-in-part of Ser. No. 241,409, April 5, 1972. This application June 14, 1973, Ser. No. 370,005
Int. Cl.² A61K *35/78*
U.S. Cl. 424—195 14 Claims

1. A method of treating P388 leukemia in mice which consists in injecting into said mice an effective amount for treating P388 leukemia of a tree sap which has been produced by extracting with water and subsequently dried and which tree is selected from the group consisting of:

Prunus virginiana var. *demissa*
Leucothoe catesbaei
Genipa americana
Chrysophyllum brenesii
Sambucus racemosa var. *arborescens* and
Chiococca alba

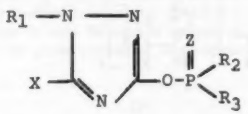
3,932,629

TRIAZOLYL PHOSPHORUS ESTERS AS PESTICIDES

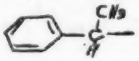
Dag Dawes, Prattein, and Beat Böhner, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 310,530, Nov. 29, 1972, Pat. No. 3,867,396. This application Dec. 6, 1974, Ser. No. 530,460
Claims priority, application Switzerland, Dec. 10, 1971, 18065/71; Sept. 29, 1972, 14254/72
Int. Cl.² A01N *9/36*
U.S. Cl. 424—200 10 Claims

1. An insecticidal, acaricidal and nematocidal composition comprising an insecticidally, acaricidally and nematocidally effective amount of a compound of the formula



wherein X represents fluorine, chlorine or bromine; Z represents oxygen or sulphur; R_1 represents C_1-C_{19} alkyl, C_5-C_8 cycloalkyl, or phenyl, benzyl, phenylethyl, diphenylmethyl or



optionally substituted by halogen, nitro, alkyl, haloalkyl, alkoxy, alkylsulphinyl or alkylsulphonyl, the alkyl groups of which each have 1–6 carbon atoms; R_2 represents C_1-C_{19} alkoxy, C_1-C_{19} alkylthio, amino, mono- or di(C_1-C_{19})alkylamino; and R_3 represents C_1-C_{19} alkyl, C_1-C_{19} alkoxy, C_1-C_{19} alkylthio, phenyl, phenoxy, amino, mono- or di(C_1-C_{19})alkylamino; together with a suitable carrier therefor.

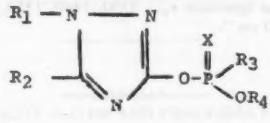
3,932,630

TRIAZOLYL PHOSPHORUS ESTERS AS PESTICIDES

Beat Böhner, Binningen; Dag Dawes, Prattein, and Willy Meyer, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 310,728, Nov. 30, 1972, Pat. No. 3,867,398. This application Dec. 6, 1974, Ser. No. 530,461
Claims priority, application Switzerland, Dec. 10, 1971, 18064/71; Sept. 29, 1972, 14254/72
Int. Cl.² A01N *9/36*
U.S. Cl. 424—200 12 Claims

1. An insecticidal, acaricidal and nematocidal composition comprising an insecticidally, acaricidally and nematocidally effective amount of a compound of the formula



wherein

R_1 represents hydrogen, C_1–C_{12} alkyl, C_5–C_8 cycloalkyl, phenyl, phenyl substituted by methoxy, halogen or C_1–C_5 alkyl, benzyl or phenylethyl,

R_2 represents C_1–C_{12} alkylthio, C_1–C_{12} alkylsulphinyl, C_1–C_{12} alkylsulphonyl, phenylthio, phenylsulphinyl, phenylsulphonyl, benzylthio, benzylsulphinyl or benzylsulphonyl,

R_3 represents C_1–C_{12} alkyl, C_1–C_{12} alkoxy, C_1–C_{12} alkylthio or phenyl,

R_4 represents C_1–C_{12} alkyl, and

X represents oxygen or sulphur; together with a suitable carrier therefor.

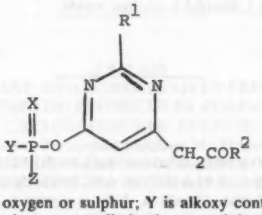
3,932,631

CERTAIN ORGANOPHOSPHORUS COMPOUNDS USED TO CONTROL INSECTS

Graham Paul Cotterrell, Wokingham, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 14, 1974, Ser. No. 451,368
Claims priority, application United Kingdom, Mar. 29, 1973, 15159/73
Int. Cl.² A01N *9/36*
U.S. Cl. 424—200 8 Claims

1. A composition, for combating insect pests of plants, which comprises an insecticidally effective amount of a compound of the formula:



wherein X is oxygen or sulphur; Y is alkoxy containing from one to four carbon atoms, alkylamino containing from one to four carbon atoms, or dialkylamino containing from one to four carbon atoms in each alkyl moiety; Z is alkoxy containing from one to four carbon atoms; R^1 is alkyl containing from one to four carbon atoms, chlorophenyl, alkylamino containing from one to four carbon atoms, dialkylamino containing from one to four carbon atoms in each alkyl moiety, or N-carboxylic acyl alkylamino containing from one to four carbon atoms

in the carboxylic acyl moiety and from one to four carbon atoms in the alkyl moiety; and R^2 is alkoxy containing from one to four carbon atoms, amino, alkylamino containing from one to four carbon atoms, dialkylamino containing from one to four carbon atoms in each alkyl moiety, or alkenyl amino containing three to five carbon atoms, together with an agriculturally and horticulturally acceptable diluent.

3,932,632
INSECTICIDAL COMPOSITIONS CONTAINING AN ORGANOPHOSPHORUS COMPOUND AND A THIOLCARBAMATE

Heinrich Adolphi, Limburgerhof; Hans-Dieter Hoffmann, Ludwigshafen; Karl-Heinz Koenig, Frankenthal, and Wolfgang Rohr, Mannheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Germany

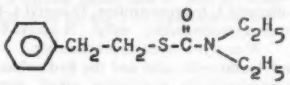
Filed Aug. 15, 1973, Ser. No. 388,427

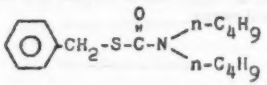
Claims priority, application Germany, Sept. 8, 1972, 2244090

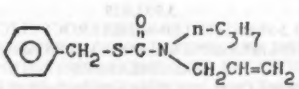
Int. Cl.² A01N *9/12, 9/36*

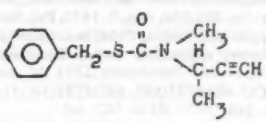
U.S. Cl. 424—213 **4 Claims**

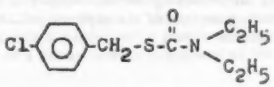
1. An insecticide composition comprising an insecticidally effective amount of a mixture (a) 0,0-dimethyl-S-(1,2-dicarbethoxy)-ethyl dithiophosphate and (b) a member selected from the group consisting of











in a weight ratio of 1:1.

3,932,633
NOVEL O-TRIAZENOBENZAMIDES, IN TREATING AGGRESSIVE BEHAVIOR

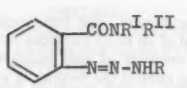
John Terence O'Brien, Chesire, and Zaven S. Ariyan, Woodbury, both of Conn., assignors to Uniroyal Inc., New York, N.Y.

Division of Ser. No. 311,878, Dec. 4, 1972. This application Mar. 4, 1974, Ser. No. 447,605

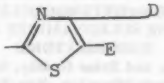
Int. Cl.² A61K *31/655*

U.S. Cl. 424—226 **4 Claims**

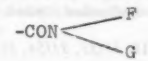
1. A method of preventing and/or inhibiting aggressive behavior in an animal subject, said method comprising administering to an animal subject a therapeutically effective amount of a compound of the formula:



wherein R is



in which D is hydrogen or methyl and E is hydrogen or



wherein F is hydrogen and G is phenyl, halophenyl, trimethylphenyl or benzyl; or F and G together with the nitrogen atom to which they are bonded, form a morpholine ring;

R' is hydrogen or methyl and R'' is hydrogen, lower alkyl, phenyl or the sulfate of a dimethylamino lower alkyl group.

3,932,634
HIGH POTENCY VITAMIN WATER DISPERSIBLE FORMULATIONS

Joseph A. Kardys, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 374,488, June 28, 1973, abandoned, which is a continuation-in-part of Ser. No. 119,362, Feb. 26, 1971, abandoned. This application Dec. 10, 1974, Ser. No. 531,332

Int. Cl.² A61K *31/595*

U.S. Cl. 424—237 **2 Claims**

1. A pharmaceutical composition for aqueous dispersion to give clear, stable solutions of vitamins consisting essentially of from about 25% to about 55%, by weight of the total composition, of oil-soluble vitamin A, vitamin D_2, vitamin D_3, vitamin E, or combinations thereof together with from about 35% to about 85%, by weight of the total composition, of a dispersing agent consisting essentially of polyoxyethylene sorbitan monooleate having about 20 oxyethylene units per molecule plus an ester selected from polyethylene glycol 400 monooleate, decaglycerol dioleate, and decaglycerol tetraoleate, the ratio of said sorbitan monooleate to said ester being from about 3:1 to about 1:3.

3,932,635
NOVEL CYCLIC PROGESTOGEN-INTERRUPTED ESTROGEN ORAL CONTRACEPTIVE REGIMENS

Eugene J. Segre, Los Altos, Calif., assignor to Syntex Corporation, Panama, Panama

Continuation-in-part of Ser. No. 247,012, April 24, 1972. This application May 5, 1972, Ser. No. 250,785

Int. Cl.² A61K *17/06*

U.S. Cl. 424—239 **21 Claims**

1. A cyclic progestogen-interrupted estrogen method of controlling fertility in a fertile woman wherein the first day of menstrual flow is considered as day 1 of a 28 day cycle, said method comprising orally administering to said woman beginning on one of the 3rd to 6th days of said cycle and every second or third day thereafter a combination oral dosage unit formulation having about 0.01 mg. to about 2.0 mg. of an estrogen and about 0.03 mg. to about 10.0 mg. of a progestogen, and orally administering to said woman beginning on one of the 4th to 7th days of said cycle and every day thereafter on which a combination formulation is not administered an oral dosage unit formulation having only a progestogen in an amount of about 0.03 mg. to about 10.0 mg. as the active

contraceptive component, said formulations being administered for a period of 20 to 23 consecutive days during said 28 day cycle, said amounts of said estrogen and progestogen being effective to control the fertility of said woman.

3,932,636

2 AND 3-SUBSTITUTED-4-(HETEROCYCLIC-AMINO-SULFONYL)BENZENE SULFONAMIDES AS CEREBRAL VASODILATORS

Peter Edward Cross, and Brian Gadsby, both of Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

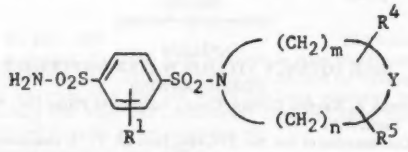
Division of Ser. No. 386,854, Aug. 9, 1973, Pat. No. 3,867,390. This application Oct. 4, 1974, Ser. No. 512,010

Claims priority, application United Kingdom, Aug. 12, 1972, 37720/73

Int. Cl.² A61K *31/33, 31/54, 31/535, 31/445*

U.S. Cl. 424—244 **4 Claims**

1. A process for increasing cerebral blood flow in a subject which comprises administering to said subject a cerebral blood flow increasing amount of a compound selected from the group consisting of



and their salts with pharmaceutically acceptable cations wherein R^1 is 3-trifluoromethyl, chloro, bromo or fluoro; *n* and *m* are each two or three; Y is methylene or a single bond and R^4 and R^5 taken together are alkylene dioxy having 2 to 4 carbon atoms, each oxygen atom in said alkylene dioxy being separated from the nitrogen atom of the heterocyclic ring by two or more carbon atoms.

3,932,637

METHODS AND COMPOSITIONS FOR IMPROVING THE FEED INTAKE OF MEAT PRODUCING ANIMALS

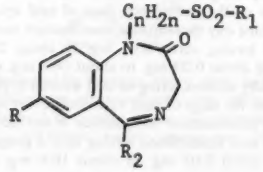
Hisao Yamamoto, Nishinomiya; Shigeho Inaba, Takarazuka; Mitsuhiro Akatsu, Toyonaka, all of Japan; Clifton A. Baile, Glen Mills, and Roger G. Parish, King of Prussia, both of Pa., assignors to Sumitomo Chemical Company, Limited, Osaka, Japan and SmithKline Corporation, Philadelphia, Pa.

Filed July 22, 1974, Ser. No. 490,813

Int. Cl.² A61K *31/33, 31/44*

U.S. Cl. 424—244 **14 Claims**

1. The method of inducing increased feed efficiency or feed intake in immature meat producing animals comprising administering to said animals internally in a feed composition or as an implant an effective but nontoxic quantity of a compound or one of its pharmaceutically acceptable non-toxic acid addition salts of the compound having the formula:



in which:

R is hydrogen, nitro, trifluoromethyl or halo;

R_1 is lower alkyl of 1–4 carbon atoms;

R_2 is phenyl, 2-pyridyl, o-halophenyl, o-trifluoromethylphenyl or o-nitrophenyl; and

n is an integer of from 2–4.

3,932,638

COMPOSITIONS AND METHODS FOR WOUND HEALING

Paul Coirre; Bertrand Coirre, both of ville d'Avray; Jean-Claude Denis, Paris; Jerome Rambaud, Paris, and Jean Cahn, Paris, all of France, assignors to Franco-Chimie S.a.r.l., Paris, France

Continuation-in-part of Ser. No. 243,397, April 12, 1972, Pat. No. 3,891,765, which is a continuation-in-part of Ser. No. 81,499, Oct. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 756,410, Aug. 30, 1968, abandoned. This application Nov. 9, 1973, Ser. No. 414,294

Int. Cl.² A61K *31/555, 31/40*

U.S. Cl. 424—245 **6 Claims**

4. An oral composition in tablet or capsule form suitable for promoting the healing of wounds in mammals comprising from 100 mg. to 200 mg. of an L-hydroxyproline derivative selected from the group consisting of N-acetyl-L-hydroxyproline, N,O-diacetyl-L-hydroxyproline, O-acetyl-L-hydroxyproline, L-hydroxyprolinamide, ethyl N-acetyl-4-hydroxy-L-prolinate, N-acetyl-L-hydroxyprolinamide, N-acetyl-L-hydroxyprolylanthranilic acid and the hydrochloride or non-toxic, pharmaceutically acceptable alkali metal, alkaline earth, copper, aluminum, silicon and zinc salts thereof, and a pharmaceutical carrier.

3,932,639

2- AND 3-SUBSTITUTED-4-(HETEROCYCLIC-AMINO-SULFONYL)BENZENE SULFONAMIDES AS CEREBRAL VASODILATORS

Peter Edward Cross, and Brian Gadsby, both of Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

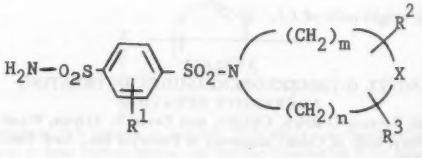
Division of Ser. No. 386,854, Aug. 9, 1973, Pat. No. 3,867,390. This application Oct. 4, 1974, Ser. No. 512,007

Claims priority, application United Kingdom, Aug. 12, 1972, 33720/72

Int. Cl.² A61K *31/535, 31/33, 31/54, 31/38*

U.S. Cl. 424—248 **5 Claims**

1. A process for increasing cerebral blood flow in a subject which comprises administering to said subject a cerebral blood flow increasing amount of a compound selected from the group consisting of:



and their salts with pharmaceutically acceptable cations wherein R^1 and 3-trifluoromethyl, chloro, bromo or fluoro; *n* and *m* are each two or three; X is oxygen or sulfur; R^2 and R^3, when taken separately, are each hydrogen or alkyl having 1 to 4 carbon atoms and R^2 and R^3, when taken together, are alkylene having 2 to 4 carbon atoms.

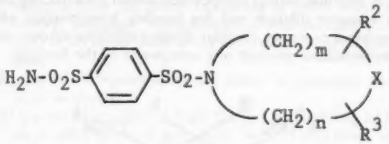
3,932,640

CYCLIC N-SUBSTITUTED DERIVATIVES OF 1,4-BENZENE DISULPHONAMIDE

Gerald F. Holland, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 386,853, Aug. 9, 1973, Pat. No. 3,867,391. This application Oct. 4, 1974, Ser. No. 512,014
Int. Cl.² A61K *31/535, 31/33, 31/54, 31/38*
U.S. Cl. 424—248 4 Claims

1. A process for increasing cerebral blood blow in a subject which comprises admistering to said subject a cerebral blood flow increasing amount of a compound selected from the group consisting of



and their salts with pharmaceutically acceptable cations wherein n and m are each two or three; X is oxygen or sulfur; R^2 and R^3, when taken separately, are each hydrogen or alkyl having 1 to 4 carbon atoms and R^2 and R^3, when taken together, are alkylene having 2 to 4 carbon atoms.

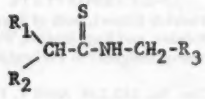
3,932,641

PHARMACEUTICAL COMPOSITIONS AND METHODS OF INHIBITING GASTRIC ACID SECRETION

Henry C. Caldwell, Ambler, and Bernard Loev, Broomall, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 266,181, June 26, 1972, Pat. No. 3,873,536, which is a continuation-in-part of Ser. No. 220,418, Jan. 24, 1972, abandoned. This application Dec. 3, 1974, Ser. No. 529,143
Int. Cl.² A61K *27/00*
U.S. Cl. 424—248 10 Claims

1. A pharmaceutical composition having gastric acid secretion inhibitory activity, in dosage unit form, comprising a pharmaceutical carrier and a gastric acid secretion inhibiting amount of a thioacetamide compound of the formula:



in which:

R_1 is 2-pyridyl;

R_2 is hydrogen, lower alkyl, lower alkenyl or $-(CH_2)_n$-phenyl;

R_3 is di-lower alkylamino, N-lower alkyl-N-phenylamino, pyrrolidino, piperidino or morpholino and

n is 0 or 1 or a pharmaceutically acceptable acid addition salt thereof.

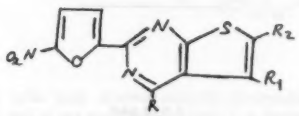
3,932,642

BIOCIDAL COMPOSITIONS CONTAINING A 2-(5'-NITRO-2'-FURYL)-THIENO(2,3-D) PYRIMIDINE AND METHODS OF USE

Eberhard Woitun, and Wolfgang Reuter, both of Biberach an der Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Division of Ser. No. 241,414, April 5, 1972, Pat. No. 3,830,813. This application July 19, 1974, Ser. No. 490,114
Claims priority, application Germany, Apr. 10, 1971, 2117658
Int. Cl.² A01N *9/22*
U.S. Cl. 424—251 12 Claims

12. A method of killing microorganisms selected from the group consisting of bacteria, fungi and trichomonads, which comprises contacting said microorganisms with an effective bactericidal, fungicidal or trichomonacidal amount of a compound of the formula



wherein

R is amino; (alkanoyl of 2 to 3 carbon atoms)-amino; chloroacetyl-amino; dichloroacetyl-amino; mono(alkyl of 1 to 5 carbon atoms)-amino; di(alkyl of 1 to 4 carbon atoms)-amino; mono(hydroxyalkyl of 1 to 5 carbon atoms)-amino; di(hydroxyalkyl of 2 to 3 carbon atoms)-amino; N-(alkyl of 1 to 4 carbon atoms)-hydroxyethylamino; dihydroxypropyl-amino; (alkoxy of 1 to 2 carbon atoms)-(alkylene of 2 to 3 carbon atoms)-amino; aminoethyl-amino; acetaminoethyl-amino; acetoxy(alkylene of 2 to 3 carbon atoms)-amino; N-acetoxy-ethyl-methylamino; or hydroxy-piperidino; and

R_1 and R_2 are each hydrogen, methyl or ethyl, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

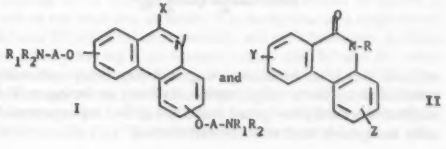
3,932,643

PHENANTHRIDINES AND PHENANTHRIDINONES AS ANTIVIRAL AGENTS

George J. Gauthier, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 431,255, Jan. 7, 1974, Pat. No. 3,838,134, which is a division of Ser. No. 240,830, April 3, 1972, Pat. No. 3,838,131. This application June 7, 1974, Ser. No. 477,529
Int. Cl.² A61K *31/47*
U.S. Cl. 424—258 11 Claims

1. A process for the induction of endogeneous interferon in vertebrate animals which comprises orally, parenterally, intranasally or topically administering to the animals a composition containing as the essential active ingredient an effective amount of a compound selected from the group consisting of those having the formulae



I II

and the pharmaceutically-acceptable acid addition salts thereof wherein X is selected from the group consisting of chloro, bromo, hydroxy, alkoxy containing from 1 to 6 carbon atoms, amino, monoalkylamino, dialkylamino wherein each of the alkyl groups contains from 1 to 6 carbon atoms, and benzylamino;

R is selected from the group consisting of hydrogen, alkyl containing from 1 to 6 carbon atoms, $-A-NR_1R_2$ wherein each of R_1 and R_2 is alkyl containing from 1 to 6 carbon atoms and A is a divalent alkylene radical containing from 2 to 6 carbon atoms; and

each of Y and Z is selected from the group consisting of hydrogen, and ω-dialkylaminoalkoxy wherein the alkyl and alkoxy groups contain from 1 to 6 carbon atoms, respectively;

with the proviso that when R is hydrogen or alkyl, each of Y and Z is ω-dialkylaminoalkoxy.

3,932,644

H2 HISTAMINE RECEPTOR INHIBITORS

Graham John Durant, Welwyn Garden city; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to SmithKline & French Laboratories, Inc., Welwyn Garden City, England

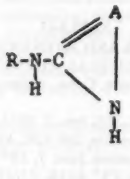
Filed Apr. 24, 1974, Ser. No. 463,647

Claims priority, application United Kingdom, May 3, 1973, 21063/73; July 26, 1973, 35551/73

Int. Cl.² A61K *31/44*

U.S. Cl. 424—263 **7 Claims**

1. A pharmaceutical composition to inhibit H-2 histamine receptors, said H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, comprising a pharmaceutical carrier and in an effective amount to inhibit said receptors a heterocyclic compound of the formula:



wherein A taken together with the nitrogen and carbon atoms shown forms a pyridine ring, said ring having a keto or thione group and optionally substituted by one or two lower alkyl, phenyl or benzyl groups; R is a grouping of the formula:

$$Het\text{-}CH_2Z(CH_2)_n\text{-}$$

wherein Het is an imidazole ring, said ring being optionally substituted by lower alkyl, amino, hydroxy or halogen; Z is sulphur or a methylene group and *n* is 2 or 3 or a pharmaceutically acceptable acid addition salt thereof.

3,932,645

PHARMACEUTICAL COMPOSITIONS CONTAINING UNSYMMETRICAL ESTERS OF 1,4-DIHYDROPYRIDINE 3,5-DICARBOXYLIC ACID

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Farbenfabriken Bayer AG, Germany

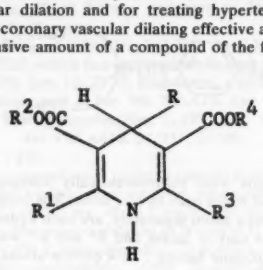
Division of Ser. No. 242,239, April 7, 1972, Pat. No. 3,799,934. This application Sept. 20, 1973, Ser. No. 398,982

Claims priority, application Germany, Apr. 10, 1971, 2117571

Int. Cl.² A61K *31/455*

U.S. Cl. 424—266 **28 Claims**

1. A pharmaceutical composition useful for effecting coronary vascular dilation and for treating hypertension which comprises a coronary vascular dilating effective amount or an antihypertensive amount of a compound of the formula:



wherein

R is mono or disubstituted phenyl in which the substituents are selected from the group consisting of nitro, cyano, azido, $-S(O)_n$-lower alkyl in which *n* has a value of 0, 1 or 2, lower alkyl, lower alkoxy and halogeno, at least one of said substituents being nitro, cyano, azido or $-S(O)_n$-lower alkyl; or a member selected from the group consisting of naphthyl, pyridyl, methylpyridyl, thenyl, furyl, and pyrryl;

each of R^1 and R^3, independent of the other, is hydrogen or lower alkyl;

R^2 is lower alkyl, lower alkenyl, lower alkynyl, or lower alkoxy(lower alkyl);

R^4 is lower alkyl, lower alkenyl, lower alkynyl, or lower alkoxy(lower alkyl), R^4 being different from R^2,

or a pharmaceutically acceptable acid addition salt thereof, in combination with a pharmaceutically acceptable non-toxic inert carrier.

3,932,646

PHARMACEUTICAL COMPOSITIONS CONTAINING UNSYMMETRICAL ESTERS OF 1,4-DIHYDROPYRIDINE 3,5-DICARBOXYLATE

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Farbenfabriken Bayer AG, Germany

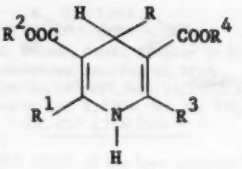
Division of Ser. No. 242,238, April 7, 1972, Pat. No. 3,799,936. This application Sept. 21, 1973, Ser. No. 399,387

Claims priority, application Germany, Apr. 10, 1971, 2117572

Int. Cl.² A61K *31/455*

U.S. Cl. 424—266 **46 Claims**

1. A pharmaceutical composition useful for effecting coronary vascular dilation and for treating hypertension in humans and animals which comprises a coronary vascular dilating amount or an antihypertensive amount of a compound of the formula:



wherein

R is phenyl, unsubstituted or substituted by a substituent selected from the group consisting of lower alkyl, lower alkoxy, halogeno, trifluoromethyl and carbo(lower alkoxy) or by up to three lower alkoxy or halogeno substituents;

R^1 and R^3, independent of the other, is hydrogen, methyl, ethyl or propyl;

R^2 is a member selected from the group consisting of lower alkyl, allyl, butenyl, propargyl, butynyl and lower alkoxy(lower alkyl);

R^4 is a member different from R^2 and is selected from the group consisting of allyl, butenyl, propargyl, butynyl and lower alkoxy(lower alkyl),

or a pharmaceutically acceptable acid addition salt thereof, in combination with a pharmaceutically acceptable non-toxic inert carrier.

3,932,647

CYCLIC N-SUBSTITUTED DERIVATIVES OF 1,4-BENZENE DISULPHONAMIDE

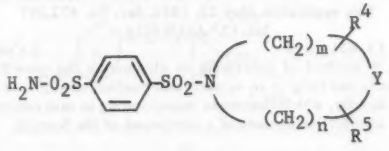
Gerald F. Holland, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 386,853, Aug. 9, 1973, Pat. No. 3,867,391. This application Oct. 4, 1974, Ser. No. 512,015

Int. Cl.² A61K *31/445, 31/33, 31/535, 31/40*

U.S. Cl. 424—267 **8 Claims**

1. A process for increasing cerebral blood flow in a subject which comprises administering to said subject a cerebral blood flow increasing amount of a compound selected from the group consisting of



and their salts with pharmaceutically acceptable cations wherein *n* and *m* are each two or three; Y is methylene or a single bond; R^4 and R^5, when taken separately, are each hydrogen, hydroxy or alkoxy having 1 to 5 carbon atoms and R^4 and R^5, when taken together, are oxo, any oxygen atom in R^4 and R^5, when taken separately, and the oxygen atom in R^4 and R^5, when taken together, being separated from the nitrogen atom of the heterocyclic ring by two or more carbon atoms.

3,932,648

CYCLIC N-SUBSTITUTED DERIVATIVES OF 1,4-BENZENE DISULPHONAMIDE

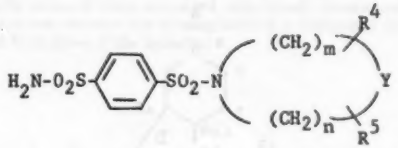
Gerald F. Holland, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 386,853, Aug. 9, 1973, Pat. No. 3,867,391. This application Oct. 4, 1974, Ser. No. 512,016

Int. Cl.² A61K *31/445, 31/33, 31/535, 31/40*

U.S. Cl. 424—267 **4 Claims**

1. A process for increasing cerebral blood flow in a subject which comprises administering to said subject a cerebral blood flow increasing amount of a compound selected from the group consisting of



and their salts with pharmaceutically acceptable cations wherein n and m are each two or three; Y is methylene or a single bond and R^4 and R^5, taken together, are alkylene dioxy having 2 to 4 carbon atoms, each oxygen atom in said alkylene dioxy being separated from the nitrogen atom of the heterocyclic ring by two or more carbon atoms.

3,932,649

2 AND 3-SUBSTITUTED-4-(HETEROCYCLIC-AMINO-SULFONYL)BENZENE SULFONAMIDES AS CEREBRAL VASODILATORS

Peter Edward Cross, and Brian Gadsby, both of Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

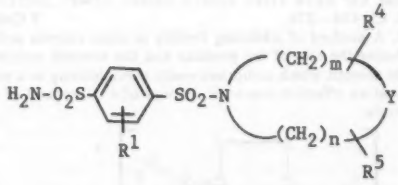
Division of Ser. No. 386,854, Aug. 9, 1973, Pat. No. 3,867,390. This application Oct. 4, 1974, Ser. No. 512,012

Claims priority, application United Kingdom, Aug. 12, 1972, 37720/72

Int. Cl.² A61K *31/445, 31/33, 31/535, 31/40*

U.S. Cl. 424—267 **11 Claims**

1. A process for increasing cerebral blood flow in a subject which comprises administering to said subject a cerebral blood flow increasing amount of a compound selected from the group consisting of



and their salts with pharmaceutically acceptable cations wherein R^1 is 3-trifluoromethyl, chloro, bromo or fluoro; *n* and *m* are each two or three; Y is methylene or a single bond; R^4 and R^5, when taken separately, are each hydrogen, hydroxy or alkoxy having 1 to 4 caron atoms and R^4 and R^5, when taken together, are oxo, any oxygen atom in R^4 and R^5, when taken separately, and the oxygen atom in R^4 and R^5, when taken together, being separated from the nitrogen atom of the heterocyclic ring by two or more carbon atoms.

3,932,650
TRANS-OCTAHYDROPYRIDOINDOLOBENZAZEPINES AS CENTRAL NERVOUS SYSTEM DEPRESSANTS

Charles De Witt Adams, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

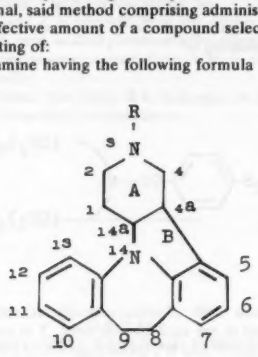
Continuation-in-part of Ser. No. 325,352, Jan. 22, 1973. This application Dec. 6, 1973, Ser. No. 422,616

Int. Cl.² A61K *31/445*

U.S. Cl. 424—267 **4 Claims**

2. A method of producing a tranquilizer effect in a warm-blooded animal, said method comprising administering to said animal an effective amount of a compound selected from the group consisting of:

A. a free amine having the following formula



wherein

R is benzyl; benzyl ring-substituted with methyl, methoxy, or chloro; phenethyl; 3-phenylpropyl; 3-phenylpropyl ring substituted with chloro, bromo, or methoxy; furfuryl; 2-thenyl; C_1–C_5 alkyl; cyclopropyl; C_4–C_8 cycloalkylmethyl; (methylcyclopropyl)methyl; exo-7-norcarylmethyl; (4-methylbicyclo[2.2.2]oct-1-yl)methyl; (bicyclo[2.2.1]hept-2-yl)methyl; 1-adamantylmethyl or 2-adamantylmethyl;

and the hydrogens in the 4a and 14a positions are in trans relationship to each other; and

B. an addition salts of a free amine of A, above, with a pharmaceutically acceptable acid.

3,932,651
METHOD OF INDUCING INFERTILITY IN MALE ANIMALS AND INHIBITING THE GROWTH OF THE PROSTATE

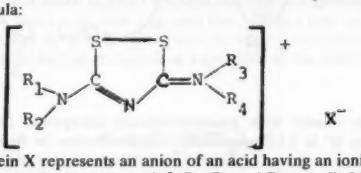
Joseph A. Settepani, Somerville, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 137,426, April 26, 1971, abandoned. This application July 23, 1973, Ser. No. 381,963

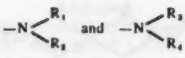
Int. Cl.² A61K *31/40, 31/425, 31/445, 31/495, 31/535*

U.S. Cl. 424—270 **7 Claims**

1. A method of inhibiting fertility in male animals and of reducing the size of the prostate and the seminal vesicle in male animals which comprises orally administering to a male animal an effective non-toxic amount of a compound of the formula:



wherein X represents an anion of an acid having an ionization constant of at least 1×10^{-7}, R_1, R_2 and R_3 are alkyl having one to 36 carbon atoms, aryl having six to 10 carbon atoms, or alkyl aryl having seven to 12 carbon atoms, R_4 is hydrogen, alkyl having one to 36 carbon atoms, aryl having six to 10 carbon atoms or alkyl aryl having seven to 12 carbon atoms, and



are each pyrrolidino.

3,932,652
ANTIDEPRESSANT COMPOSITIONS

Willy Haefely, Reinach, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 371,441, June 19, 1973, abandoned. This application Feb. 27, 1975, Ser. No. 553,781

Claims priority, application Switzerland, June 30, 1972, 9846/72

Int. Cl.² A61K *31/40, 31/165*

U.S. Cl. 424—274 **10 Claims**

1. A therapeutic composition for the treatment of depression and insomnia comprising a therapeutically inert, pharmaceutically acceptable carrier material, and as an active ingredient from about one part to about four parts by weight L-5-hydroxy-tryptophan or the equivalent amount of a pharmaceutically acceptable salt thereof and from one part to about five parts by weight N^1-(D,L-seryl)-N^2-(2,3,4-trihydroxybenzyl)-hydrazine or the equivalent amount of a pharmaceutically acceptable acid addition salt thereof.

3,932,653
COMPOSITION AND METHOD FOR TOPICAL ADMINISTRATION OF GRISEOFULVIN

Richard B. Stoughton, Rancho Santa Fe, Calif., assignor to Nelson Research & Development Co., Irvine, Calif.

Filed Dec. 19, 1974, Ser. No. 534,227

Int. Cl.² A61K *31/34*

U.S. Cl. 424—285 **6 Claims**

1. A composition useful in the topical treatment of fungal infections of the skin and nails comprising about 0.1 to about 10 percent by weight of griseofulvin together with about 5 to about 99.9 percent by weight of a compound selected from the group consisting of 2-pyrrolidone and an N-lower alkyl-2-pyrrolidone.

3,932,654
PRESERVATION OF AQUEOUS SYSTEMS WITH DIALKYL BROMONITROMALONATES

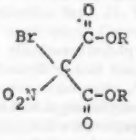
Harold A. Brandman, Glen Ridge; Milton Manowitz, Fair Lawn, and William E. Newman, Montclair, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Continuation of Ser. No. 209,988, Dec. 20, 1971, abandoned. This application May 22, 1974, Ser. No. 472,397

Int. Cl.² A01N *9/24*

U.S. Cl. 424—313 **6 Claims**

1. A method of preventing or eliminating the growth of bacteria and fungi in an aqueous composition subject to spoilage thereby, which comprises incorporating in said composition an effective amount of a compound of the formula



where in R is a straight chain alkyl group having from 1 to 4 carbon atoms.

3,932,655

SURGICAL SKIN SCRUB

Richard H. Conn, Detroit, Mich., assignor to International Pharmakon Laboratories, Inc., Detroit, Mich.

Continuation of Ser. No. 289,089, Sept. 14, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 458,549

Int. Cl.² A01N 9/00

U.S. Cl. 424—317 4 Claims

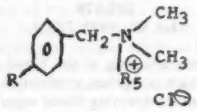
1. A surgical skin scrub of the type adapted for topical application to a user's skin consisting essentially of:

a. from about 99.0 to 99.9 percent by weight of inert ingredients, and

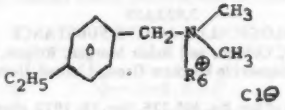
b. from about 0.1 to 1.0 percent by weight of an active ingredient consisting essentially of:

1. from about 25 to 50 percent by weight of a chelating agent selected from the group consisting of ethylene diamine tetraacetic acid, disodium ethylene diamine tetraacetic acid, gluconic acid, lactic acid, citric acid, sodium gluconate, sodium lactate, sodium citrate, potassium gluconate, potassium lactate and potassium citrate, and

2. from about 50 to 75% by weight of a mixture of three n-alkyl benzalkonium chlorides, the first and second of which are of the formula:



wherein R is hydrogen, R_5 is n-alkyl having from 12 to 18 carbon atoms or mixtures thereof, the first benzalkonium chloride having an R_5 distribution of C_{12} about 5 percent; C_{14} about 60 percent; C_{16} about 30 percent and C_{18} about 5 percent; the second benzalkonium chloride having an R_5 distribution of C_{12} about 50 percent; C_{14} about 30 percent; C_{16} about 15 percent and C_{18} about 5 percent; and the third benzalkonium chloride is of the formula:



wherein R_6 is n-alkyl having a distribution of C_{12} from 65 to 75 percent and C_{14} from 25 to 35 percent, and wherein the benzalkonium chlorides are present in a respective weight ratio of about 2:1:2.

3,932,656

ARTICLE OF MANUFACTURE FOR INSTANT RELEASE OF ANTI-AGGREGATION AND NON-THROMBOGENIC AGENTS TO BIOLOGICAL MEDIA

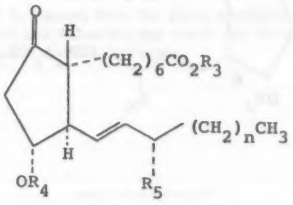
Peter W. Ramwell, McLean, Va.; Hideo Shio, Kyoto, Japan, and Jane E. Shaw, Atherton, Calif., assignors to ALZA Corporation, Palo Alto, Calif.

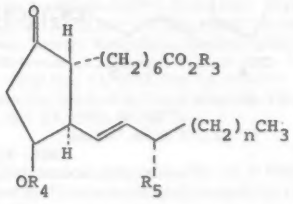
Continuation-in-part of Ser. No. 71,255, Sept. 10, 1970, abandoned. This application Dec. 20, 1973, Ser. No. 426,444

Int. Cl.² A61K 9/00, 31/19, 31/195, 31/725

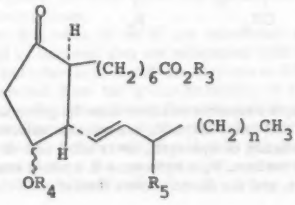
U.S. Cl. 424—16 11 Claims

1. A novel article of manufacture wherein said article consists essentially of a biologically acceptable synthetic polymer having imbibed into its outermost surface and coated thereon a platelet aggregation inhibiting amount of prostaglandin that is easily released when contacted with blood, plasma and platelets and wherein the prostaglandin is a compound selected from those of the formulae:



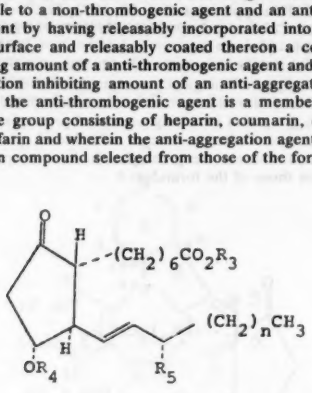


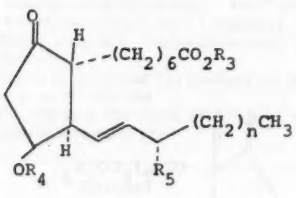
and



wherein R_3 is a member selected from the group consisting of hydrogen and lower alkyl, R_4 is a member selected from the group consisting of hydrogen, lower alkyl and an acyl group of 2 to 18 carbons, R_5 is hydroxy, *n* is a whole integer of 3 to 5 inclusive, and the diastereomers thereof.

6. An article of manufacture consisting essentially of a biologically acceptable synthetic polymer and wherein the polymer has at least one blood contacting surface rendered releasable to a non-thrombogenic agent and an anti-aggregation agent by having releasably incorporated into the polymeric surface and releasably coated thereon a coagulation inhibiting amount of a anti-thrombogenic agent and a platelet aggregation inhibiting amount of an anti-aggregation agent wherein the anti-thrombogenic agent is a member selected from the group consisting of heparin, coumarin, dicumarol and warfarin and wherein the anti-aggregation agent is a prostaglandin compound selected from those of the formulae:





wherein R_3 is a member selected from the group consisting of hydrogen and lower alkyl, R_4 is a member selected from the group consisting of hydrogen, lower alkyl and an acyl group of 2 to 18 carbons, R_5 is hydroxy, *n* is a whole integer of 3 to 5 inclusive, and the diastereomers thereof.

3,932,657

LIPOSOME ENCAPSULATION OF CHELATING AGENTS

Yueh Erh Rahman, Downers Grove, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 12, 1973, Ser. No. 415,077
Int. Cl.[2] A61K *31/195, 47/00*
U.S. Cl. 424—319 9 Claims

1. A method of transferring a polyaminopolycarboxylic acid chelating agent across a cellular membrane comprising: encapsulating said polyaminopolycarboxylic acid chelating agent within liposomes; and carrying said liposome encapsulated chelating agent to said cellular membrane, whereby said liposome encapsulated chelating agent will transfer across said cellular membrane.

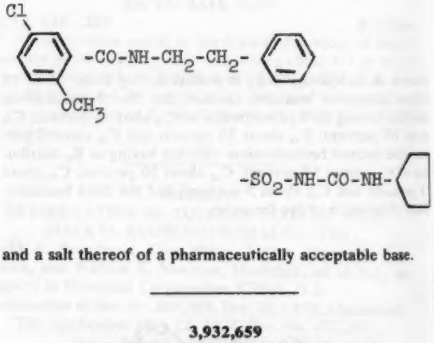
3,932,658

COMPOSITION AND METHOD FOR LOWER BLOOD SUGAR CONTAINING N-[4-(β-<2-METHOXY-5-CHLORO-BENZAMIDO>-ETHYL)-BENZENESULFONYL]-N'-CYCLOPENTYL-UREA

Helmut Weber, Frankfurt am Main; Walter Aumuller; Karl Muth, both of Kelkheim-Taunus, and Rudi Weyer, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

No Drawing. Division of Ser. No. 10,659, Feb. 11, 1970, Pat. No. 3,754,030. This application Oct. 16, 1972, Ser. No. 297,679
Int. Cl. A61k *27/00*
U.S. Cl. 424—321 2 Claims

1. Process for the lowering of the blood sugar level in a diabetic patient which comprises administering to the patient an effective amount for lowering blood sugar of N-[4-(β-<2-methoxy-5-chlorobenzamido>-ethyl)-benzenesulfonyl]-N'-cyclopentyl-urea of the formula



and a salt thereof of a pharmaceutically acceptable base.

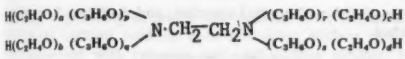
3,932,659

BIOLOGICALLY ACTIVE SUBSTANCE

Joseph Green, London, and Brian Morgan, Reigate, both of England, assignors to Beecham Group Limited, United Kingdom

Continuation of Ser. No. 305,225, Nov. 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 113,052, Feb. 5, 1971, abandoned. This application Feb. 25, 1974, Ser. No. 445,096
Claims priority, application United Kingdom, July 24, 1970, 35916/70
Int. Cl.[2] A61K *27/00*
U.S. Cl. 424—325 4 Claims

1. A method for reducing the serum cholesterol level of an animal or human being in need thereof, which comprises orally administering to such animal or human being an amount of at least one non-ionic surfactant of the formula:



as sole hypocholesterolaemic agent, wherein a,b,c,d,p,q,r and s are integers such that the (C_3H_6O) groups account for about 10% of the total molecular weight and the partial molecular weight due to the (C_3H_6O) groups is about 2,750.

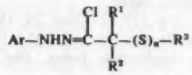
3,932,660

INSECTICIDAL PHENYLHYDRAZONE SULFIDES

Joseph E. Moore, Richmond, Calif., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 470,481, May 16, 1974, Pat. No. 3,867,449. This application Jan. 27, 1975, Ser. No. 544,150
Int. Cl.² A01N 9/20
U.S. Cl. 424—327 24 Claims

1. A method for inhibiting the normal growth pattern of insects which comprises contacting pre-adult insects with a metamorphosis-inhibiting amount of a compound of the formula



wherein R^1 is hydrogen or alkyl of 1 to 6 carbon atoms, R^2 is hydrogen or alkyl of 1 to 6 carbon atoms, R^3 is alkyl of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms containing 1 to 5 fluoro, chloro or bromo atoms or phenyl substituted with up to 3 fluoro, chloro or bromo atoms, Ar is phenyl substituted with up to 5 fluoro, chloro or bromo atoms and *n* is 1, 2 or 3.

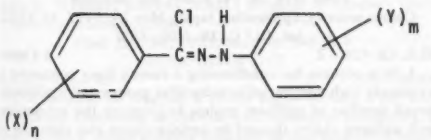
3,932,661

ANTHELMINTIC METHODS EMPLOYING BENZOYL CHLORIDE PHENYLHYDRAZONES

Girts Kaugars, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 67,220, Aug. 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 779,251, Nov. 26, 1968, Pat. No. 3,879,543, which is a continuation-in-part of Ser. No. 709,943, March 4, 1968, abandoned. This application Apr. 17, 1974, Ser. No. 461,705
Int. Cl.² A61K 31/15
U.S. Cl. 424—327 9 Claims

1. A method of controlling parasitic worms in animals which comprises administering orally or parenterally to an animal a therapeutic or prophylactic dosage of a benzoyl chloride phenylhydrazone having the structural formula:



wherein X is halogen, alkyl of from 1 to 6 carbon atoms, inclusive, and nitro; Y is halogen, alkyl of from 1 to 6 carbon atoms, inclusive, and nitro; *n* is an integer from 0 to 5, inclusive; and m is an integer from 0 to 3, inclusive; the sum of *n*+*m* being not more than 6, the sum of carbon atoms in alkyl substituents being not more than 15, and there being no more than one nitro group in the molecule.

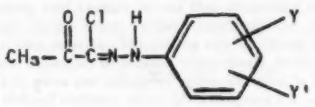
3,932,662

METHOD OF TREATING ANIMALS AND FORMULATIONS THEREFOR

Malcolm W. Moon, and Girts Kaugars, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed May 20, 1974, Ser. No. 471,235
Int. Cl.² A01N 9/20, 9/24
U.S. Cl. 424—327 7 Claims

1. A method of killing and controlling parasitic worms in animals which comprises administering to an animal a therapeutic or prophylactic dosage of a pyruvoyl chloride phenylhydrazone of the formula



wherein Y is selected from the group consisting of chloro, bromo, nitro and trifluoromethyl and Y′ has the same meaning as Y and in addition hydrogen.

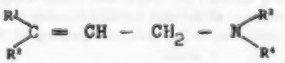
3,932,663

CERTAIN 3-AMINO-PROP-1-ENES FOR TREATING *TRYPANOSOMA CRUZI* INFECTIONS

Paul Anthony Barrett, Beckenham, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Dec. 13, 1972, Ser. No. 314,845
Claims priority, application United Kingdom, Dec. 29, 1971, 60315/71; Oct. 23, 1972, 48748/72
Int. Cl.² A61K 31/135
U.S. Cl. 424—330 36 Claims

1. A pharmaceutical composition for use in treating infections caused by *Trypanosoma cruzi* comprising a compound of formula (I)



wherein R^1 and R^2 are the same or different and can each represent a substituted or unsubstituted biphenylyl or fluorenyl group, or one only of R^1 and R^2 can represent a substituted or unsubstituted phenyl group, with the proviso that both R^1 and R^2 cannot represent a substituted biphenylyl gruop and that when one of R^1 and R^2 represents a substituted biphenylyl group, the other represents a substituted or unsubstituted phenyl group,

provided that when R^1 or R^2 are substituted biphenylyl, phenyl or fluorenyl they are substituted with halogen or nitro and wherein R^3 and R^4 are the same or different and are selected from the group consisting of a hydrogen atom, an alkyl group having from 1 to 4 carbon atoms and a benzyl group; or a pharmaceutically acceptable salt thereof in an amount effective to treat infections of *Trypanosoma cruzi*, in association with a pharmaceutically acceptable carrier therefor.

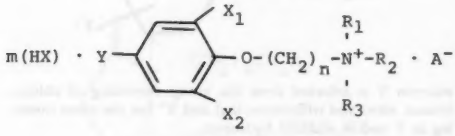
3,932,664

SUBSTITUTED PHENOXYALKYL QUATERNARY AMMONIUM COMPOUNDS AS ANTIARRHYTHEMIC AGENTS

Stanley J. Strycker, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 164,086, July 19, 1971, Pat. No. 3,875,215. This application July 1, 1974, Ser. No. 484,525
Int. Cl.² A61K *31/22, 31/33, 31/44, 31/46, 31/135, 31/275*
U.S. Cl. 424—330 16 Claims

9. A method for combatting cardiac arrhythmias which comprises administering to an animal a cardiac anti-arrhythmic amount of a quaternary ammonium compound corresponding to the formula:



wherein Y represents amino or dilower-alkylamino; R_1 and R_2 represent lower alkyl; R_3 independently represents lower alkenyl or lower alkynyl; X_1 and X_2 both represent halogen; A^- represents a stoichiometric equivalent quantity of a pharmaceutically-acceptable anion; n represents one of the integers 2, 3 or 4; HX represents a stoichiometric equivalent quantity of a pharmaceutically-acceptable acid; and *m* represents one of the integers 0 and 1.

3,932,665

PROCESS FOR THE TREATMENT OF ACNE VULGARIS UTILIZING RETINAL

Eugene J. Van Scott, 1138 Sewell Lane, Rydal, Pa. 19046, and Ruey J. Yu, 4400 Dexter St., Philadelphia, Pa. 19128

Filed Apr. 5, 1974, Ser. No. 458,095
Int. Cl.² 424 *344;* A61K *31/11*
U.S. Cl. 424—333 3 Claims

1. A method of treating acne vulgaris in a human having skin affected thereby, which method consists of:

administering topically to the affected skin a therapeutically effective amount of retinal on a daily basis to promote improvement of the skin without causing worsening of the acne, irritation to the skin, and peeling of the skin.

3,932,666

TREATMENT OF TREES FOR PREVENTION AND CURE OF WILT DISEASES

David J. Bennett, Manlius, N.Y., assignor to Environmental Technology Corporation, Bloomington, Minn.

Continuation-in-part of Ser. No. 323,056, Jan. 12, 1973, abandoned. This application Apr. 15, 1974, Ser. No. 460,764
Int. Cl.² A01N *9/24*
U.S. Cl. 424—341 10 Claims

1. A method for the treatment of elm trees for the fungus disease of the vascular system thereof caused by ceratocystis ulmi which comprises injecting into the vascular system of the tree an alcoholic carrier solution of a fungicidally effective quantity of a chlorinated compound selected from the group consisting of 5-chloro-creosol, 6-chloro-creosol, 5,6,-dichloro-creosol, 6-chloro-catechol, 5-chloro-3,4-dimethoxy-toluene, 3-chloro-5 methyl-catechol, and 4-chloro-5 methyl-catechol.

3,932,667

ETHER COMPOUND AS AN INHALATION ANESTHETIC

Ross C. Terrell, Plainfield, N.J., assignor to Airco, Inc., Montvale, N.J.

Division of Ser. No. 168,400, Aug. 2, 1971, Pat. No. 3,746,770. This application Apr. 5, 1973, Ser. No. 348,406
Int. Cl. A61k *27/00*
U.S. Cl. 424—342 2 Claims

2. A method of anesthetizing an anesthetic-susceptible mammal which comprises administering by inhalation to the mammal an anesthetically-effective amount of an aliphatic ether compound of the formula $CF_3(CH_3)CH—O—CF_2CF_2H$ while administering life-supporting amounts of oxygen.

3,932,668

COMPOSITION FOR TREATING SWINE SCOUR

Yasuharu Sekizawa; Shigeo Seki; Bunzo Nomiya, all of Tokyo; Takemi Koeda, Yokohama; Fumio Kai, Fujisawa; Naotoshi Akai, Kokubunji; Yasushi Yusa, and Fuguaki Fukuyasu, both of Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Division of Ser. No. 319,127, Dec. 29, 1972, Pat. No. 3,859,362. This application Dec. 10, 1974, Ser. No. 531,415
Claims priority, application Japan, Dec. 28, 1971, 46-105753
Int. Cl.² A61K *31/08*
U.S. Cl. 424—342 1 Claim

1. A composition for treating the diarrhea of swine consisting essentially of an effective amount of 2,3,3-triiodo-allyl-methyl ether and a pharmaceutically acceptable carrier.

3,932,669

1-CHLORO-2,2-DIMETHYL-1,4,4-TRIFLUOROCYCLOBUTANE AS AN ANESTHETICS

Robert S. Holdsworth; Gerald J. O'Neill, both of Arlington, Mass., and Paul Tarrant, Gainesville, Fla., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Jan. 10, 1975, Ser. No. 539,958
Int. Cl.² A61K *31/025*
U.S. Cl. 424—352 1 Claim

1. The process of inducing anesthesia in a mammal, which comprises administering by inhalation to said mammal an effective quantity, to induce anesthesia, of 1-chloro-2,2-dimethyl-1,4,4-trifluorocyclobutane.

3,932,670

METHOD OF MANUFACTURING A BACTERIAL PREPARATION CONSISTING OF A NORMAL RUMEN BACTERIAL FLORA WITH AN IMPROVED ABILITY TO UTILIZE AMMONIUM SALTS

Nobuo Sakurai, Chiba, Japan, assignor to Miyairi Kinzai Kenkyusho Company Limited, Japan

Filed May 24, 1973, Ser. No. 363,558
Claims priority, application Japan, May 29, 1972, 47-53122
Int. Cl.² C12K *1/00, 3/00*
U.S. Cl. 426—2 8 Claims

1. In a process for conditioning a rumen flora containing a relatively high number of lactobacillus groups and a relatively small number of coliform groups to improve the ammonium salt utilizing ability thereof by serial passage and culturing of microorganisms on a streak inoculated plate culture medium containing the maximum ammonium salt concentration compatible with serial passage culture growth, the improvement which comprises:

a. further culturing colonies of said microorganisms which have been cultured in said streak inoculated plate culture medium containing the maximum ammonium salt concentration compatible with serial passage culture growth

by repeatedly streaking said colonies over the surface of said culture medium until the entire surface thereof is covered with colonies and said culture medium is enriched with sufficient metabolic products from the growth of said microorganisms therein to condition said microorganisms to grow in the presence of ammonium salt concentrations higher than said maximum; and

b. transferring colonies of the resultant conditioned microorganisms to a new culture medium having an ammonium salt concentration higher than said maximum, and repeating step a) in said new culture medium.

3,932,671

PROCESS FOR PRODUCING PROTEIN HYDROLYZATE

Tamotsu Yokotsuka, Nagareyama; Takashi Iwaasa, Noda; Tadao Okami, Chiba; Minoru Noda, Kamagaya, and Mitsuharu Fujii, Noda, all of Japan, assignors to Kikkoman Shoyu Co., Ltd., Japan

Filed Mar. 20, 1973, Ser. No. 342,982

Claims priority, application Japan, Mar. 27, 1972, 47-29825

Int. Cl.² A23B *4/12*

U.S. Cl. 426—7 **15 Claims**

1. In a process for producing a protein hydrolyzate from proteinaceous materials by hydrolysis with proteolytic enzymes in an aqueous medium to form a protein partial hydrolyzate containing polypeptides the improvement comprising inoculating and culturing salt-resistant lactic acid bacteria selected from the group consisting of *Pediococcus halophilus*, *Pediococcus soyae*, *Tetracoccus soyae* and *Streptococcus thermophilus* in the aqueous medium containing said protein partial hydrolyzate and up to 12 percent by weight of sodium chloride based on the volume of the aqueous medium until the free amino acid content in the aqueous medium is increased.

3,932,672

GELLABLE PROTEIN

Akiva Pour-El, 1389 Keston St., St. Paul, Minn. 55108, and Thomas C. Swenson, Rte. No. 1, Box 340, Deerwood, Minn. 56444

Filed Sept. 19, 1974, Ser. No. 507,649

Int. Cl.² A23L *1/20*; **A23J** *3/02*

U.S. Cl. 426—46 **5 Claims**

1. A process for producing a gellable and whippable acid-insoluble protein material comprising removing insoluble matter from a proteinaceous material to obtain an acid insoluble protein isolate, enzymatically modifying the isolate with a protelytic enzyme at alkaline pH, reisolating the digested isolate by acid precipitation and then raising the pH above the pH of digestion for a relatively short time and then neutralizing and recovering the modified acid insoluble protein material.

3,932,673

FRUIT STUFFED WITH BRINE RESISTANT HARD GEL AND METHOD OF FORMING THE SAME

John R. Webster, Lindsay, Calif., assignor to Lindsay Olive Growers, Lindsay, Calif.

Filed Jan. 10, 1975, Ser. No. 540,254

Int. Cl.² A23B *7/10*

U.S. Cl. 426—49 **18 Claims**

1. A method of treating a pitted drupe having a pit well comprising depositing in the pit well a mixture containing a finely divided edible stuffing material having undesired sugar therein, a low methoxyl pectin gelling agent, and a slowly soluble source of calcium ions producing a calcium ion concentration of from at least about 0.0039 to 0.078 percent by weight, which mixture has previously been heated to from 100°C. to 70°C. for from five minutes to thirty minutes; and fermenting the sugar contained in the stuffing material while in the pit well in an aqueous solution of sodium chloride, a slowly soluble calcium salt and sufficient acid to maintain the pH of the solution between 2.8 and 3.9, the calcium ions from the calcium salt in the brine being present in at least about 1.4 to 5.5 percent by weight of the sodium chloride.

3,932,674

CONTROLLED BULK VEGETABLE FERMENTATION

John L. Etchells; Thomas A. Bell; Henry P. Fleming, and Roger L. Thompson, all of Raleigh, N.C., assignors to The United States of America, Washington, D.C.

Filed Nov. 29, 1974, Ser. No. 528,454

Int. Cl.² A23L *1/218*

U.S. Cl. 426—52 **10 Claims**

1. A rapid, controlled bulk fermentation process for vegetables, under conventional pack-out conditions, which comprises washing said vegetables and then immersing them in a 15°–32° salometer brine; further sanitizing the resulting vegetable/brine mass by chlorinating and acidifying the brine to the extent necessary to provide, respectively, from about 50 to about 100 parts per million of active chlorine in the brine and a pH thereof between about 2.7 and about 3.2, said chlorine destroying substantially all the microflora in the brine; maintaining initial brine strengths by counteracting dilution of the brine resulting from diffusion of vegetable moisture by incrementally adding salt to the brine until the point of near equilibration, the brine at that point containing between about 0.2 and about 0.6% sugar, by volume; repeating the chlorine sanitizing step at least once about midway between the original chlorination and equilibration to again destroy microflora build-up in the brine; uniformly buffering the nutrient-containing brine to a pH between about 4.2 and 4.8; then adding to said brine a viable culture of one or more species of lactic acid bacteria either singly or in conjunction; sweeping with an inert gas autogenously-produced CO_2 from the brine during the above steps, this purging being carried out until fermentation is essentially complete, i.e., when the sugar content of the vegetable/brine mass is near zero and there is essentially no further development of brine acid; and the above process being carried out at a temperature in the range of about 65°F. to about 90°F.

3,932,675

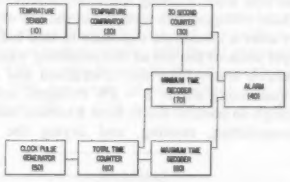
METHOD FOR TIMED COOKING OF A FOOD PRODUCT

Duane C. Main, Woodridge, Ill., assignor to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 354,148, April 24, 1973, Pat. No. 3,859,644. This application Oct. 25, 1974, Ser. No. 518,203

Int. Cl.² A01K *43/00*

U.S. Cl. 426—233 **3 Claims**



1. A method for determining the state of readiness of a food product and indicating the completion of a cooking cycle for the product immersed in a preheated cooking medium comprising the steps of:

monitoring the temperature of the cooking medium and generating a timer control signal when said temperature reaches a predetermined level after immersion of the food product for energizing a fixed interval timer, the timing interval of which establishes a desired cooking

period for the product at said predetermined temperature level, inhibiting the start of said timing interval for a fixed time period after immersion of said food product in the heated cooking medium to thereby establish a minimum cooking time for tahe product immersed in the heated cooking medium, said minimum cooking time including the total of the fixed period plus the period of the interval timer and the time necessary for the cooking medium to reach said predetermined level after completion of the inhibiting fixed period, initiating the timing of an override time period upon immersion of the food product in the cooking medium to thereby establish the maximum cooking time for the produce immersed in the cooking medium, and energizing an alarm either in response to completion of the timing interval or completion of the override time period even though the desired cooking period for the product at said predetermined temperature level has not been maintained to indicate that the product is at the desired state of readiness.

3,932,676

METHOD FOR DYEING PROTEIN ARTICLES OF FOOD, ESPECIALLY PROTEIN CASINGS

Mieczyslaw Janicki; Henryk Muler, and Wladyslaw Nijaki, all of Warsaw, Poland, assignors to Instytut Prezemyslu Miesnego, Warsaw, Poland

Filed Aug. 30, 1974, Ser. No. 502,104

Claims priority, application Poland, Sept. 1, 1973, 165010

Int. Cl.² A23L *1/275*

U.S. Cl. 426—250 **11 Claims**

1. A method for dyeing a protein food product comprising subjecting the product to the action of a dyeing substance consisting of a wood-bark extract in form of an aqueous solution having a concentration of from 0.5 to 5% until the desired color is imparted to the food product.

3,932,677

COLLAGEN CASINGS FROM LIMED HIDE COLLAGEN

Noel I. Burke, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Filed Oct. 22, 1974, Ser. No. 517,277

Int. Cl.² A22C *13/00*; **A23J** *1/10*

U.S. Cl. 426—277 **3 Claims**

1. A process for preparing an edible collagen casing from a hide collagen source which has been completely limed for a period from seven days to several months which comprises deliming the completely limed hide collagen by treating said hide with a dilute, edible acid at a pH of about 4.0 to 5.5 for a time sufficient to reduce the pH in the center of the hide to less than about 5.5 to form water soluble calcium salts from the lime in said hide, washing the water soluble calcium salts from the hide collagen with water until the pH of the supernatant water after a 20-minute exposure to said hide is within at least 0.2 pH units of the pH of the incoming water, forming a soft extrudable slurry from the neutralized and washed hide collagen containing about 2 – 8% collagen, extruding said slurry through an annular die to form a tubular edible collagen casing, coagulating, tanning, and drying the casing thus formed.

3,932,678

NOVEL DIHYDROCHALCONE SWEETENER COMPOSITIONS

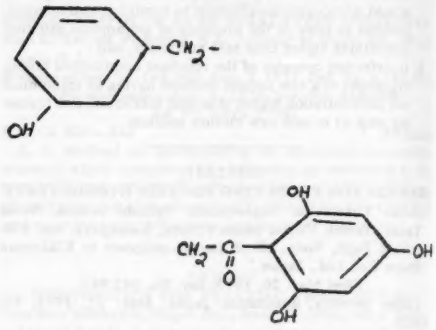
George P. Rizzi, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 157,682, June 28, 1971, Pat. No. 3,855,301. This application June 25, 1974, Ser. No. 482,963

Int. Cl.² A23L *1/236*

U.S. Cl. 426—548 **9 Claims**

1. A sweetener composition comprising from about a 5×10^{-4} molar to about a 2.0 molar concentration of 3-(m-hydroxyphenyl)phloropropiophenone of the formula



and a solvent selected from the group consisting of ingestible, polar, organic liquids, and mixtures of ingestible, polar, organic liquids and water, said mixtures containing at least about 0.15% by weight of said ingestible, polar, organic liquids.

3,932,679

PROCESS FOR THE PREPARATION OF PROTEIN-FREE WAFERS

Silvio Salza, 46, Via Sottoborgo, 56100 Pisa, Italy

Filed Aug. 15, 1973, Ser. No. 388,432

Claims priority, application Italy, Aug. 18, 1972, 69664/72

Int. Cl.² A21D *10/04*, *8/06*

U.S. Cl. 426—549 **3 Claims**

1. A process for preparing protein-free wafers comprising the steps of mixing ingredients consisting essentially of starch and water to form a homogeneous pourable mixture, stirring into said mixture a stabilizing agent consisting of an aqueous dispersion of gelatinized starch, continuing said stirring until a completely homogeneous batter is obtained, pouring said batter in a thin layer into molds and baking the batter to form wafers, the total amount of starch being not more than an equal part by weight of the total amount of water utilized to form said wafer, said stabilizing agent comprising from 0.5 to 1.0% by weight of the total amount of starch and 8 to 15% by weight of the total amount of water.

3,932,680

PRODUCTION OF STERILE YOGHURT

Franz Egli, and Franz Egli, both of Lucerne, Switzerland, assignors to Zentralschweizerischer Milchverband, Lucerne, Switzerland

Filed Jan. 11, 1974, Ser. No. 432,657

Claims priority, application Switzerland, Sept. 20, 1973, 13507/73

Int. Cl.² A23C *9/12*

U.S. Cl. 426—43 **7 Claims**

1. A method for the production of sterile yoghurt which comprises concentrating pasteurized and homogenized milk by 10% by weight at a temperature of about 92°C in which the pasteurization is effected at a temperature of at least 90°C, thereafter adding 10% – 12% by weight sugar, cooling to about 40°C, adding cultures of lactic acid bacteria and incubating to a pH-value of 4 to 4.3 over 2-½ to 4 hours at 42°C to 44°C after incubation, cooling to 20°C to 30°C, cooling the yoghurt thus produced to a temperature of 4°C to 12°C and adding thereto an effective amount of stabilizer A, which contains by weight 20–30% emulsifier, 30–40% carageen,

30–40% carboxymethylcellulose, 2–3% carob-bean meal or powder, and 4–8% guar meal or powder; stabilizer B, which is potato starch or other starch; and stabilizer C, which contains by weight 75–85% pure modified plant starch and 15–25% of 60% modified gelatin and sucrose wherein the sucrose is the carrier, for the dissolving or distribution of proteins, and permitting the resulting mass to stand at 4°C to 12°C for 5–7 hours, thereafter filling the mass into containers, hermetically sealing the resulting packages, sterilizing the packages in an autoclave at a temperature in the range of 60°C to 85°C and at a pressure up to 2 atmospheres for a time sufficient to sterilize, cooling the packages under pressure to 10°C to 15°C, further storing the packages for 2–4 days at a temperature of 4°C - 6°C, and finally storing the packages at room temperature.

3,932,681

CERAMIC MASKING METHOD

Ray B. Forker, Jr., Horseheads, and Joseph N. Panzarino, Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 11, 1974, Ser. No. 449,897
Int. Cl.² B44D *1/52, 3/20*
U.S. Cl. 427—282 **7 Claims**

1. A method of masking a ceramic surface against sprayed coating compositions which comprises the steps of:

applying to selected portions of said surface to be masked a fluid suspension comprising a heat-resistant masking composition and a volatile liquid vehicle, said masking composition consisting essentially, in weight percent, of about 40–90% of a bentonite clay and 10–60% by weight of a finely-divided refractory metal oxide release agent, to provide a coating of said suspension on said surface; and

drying the coating at a temperature in excess of about 100°C. to remove said volatile liquid vehicle therefrom.

3,932,682

AIR PERMEABLE WATERPROOF PRODUCTS HAVING FABRIC-LIKE AESTHETIC PROPERTIES AND METHODS FOR MAKING THE SAME

John T. Loft, Springfield; Steven G. Piovan, Livingston, and Clifford M. Vogt, Madison, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 43,563, June 4, 1970, Pat. No. 3,690,977.
This application Apr. 26, 1972, Ser. No. 247,561
Int. Cl.² D04H *1/04*
U.S. Cl. 428—296 **3 Claims**

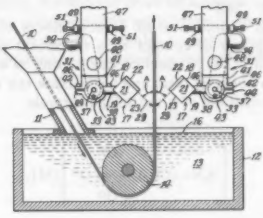
1. An air-permeable waterproof product having fabric-like aesthetic properties which product comprises an open-celled microporous polyolefin film, the microporous film being characterized by a reduced bulk density as compared to the bulk density of a corresponding polyolefin film having no open-celled structure, a crystallinity above about 30 percent, and a pore size of less than 5,000 Angstroms as porosimetrically determined by mercury penetration; and spray spun substantially continuous randomly arranged filamentary polyolefin material of varying crystallinity and diameter which filamentary material is thermally bonded to itself at randomly located filament crossover points and to the film at randomly located contact points between the filamentary material and the film which filament sections extend generally parallel to the plane of the film.

3,932,683

CONTROL OF COATING THICKNESS OF HOT-DIP METAL COATING

Norman A. Robins, Flossmoor, and Frank H. Bugajski, South Holland, both of Ill., assignors to Inland Steel Company, Chicago, Ill.

Filed Oct. 10, 1972, Ser. No. 296,293
Int. Cl.² C23C *1/04, 1/06, 1/08*
U.S. Cl. 427—349 **8 Claims**



1. In a continuous hot-dip coating line wherein a metal strip is passed through a molten coating bath at a line speed not greater than about 150 feet per minute and is withdrawn vertically from the bath between a pair of gas blowing nozzles for impinging only a single stream of gas against each side of said strip and thereby controlling the coating thickness, the improvement which comprises directing the gas stream from each of said nozzles generally downwardly against the strip at an angle between the strip and the center line of the gas stream of not more than about 40°, whereby to eliminate or substantially minimize ripple formation on the surface of the coated product.

3,932,684

PHENOLIC AGENTS FOR DISINFECTING STALLS

Georg Lauermann, Metzkausen, and Uwe Trabitzsch, Langenfeld, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Apr. 1, 1974, Ser. No. 456,894
Claims priority, application Germany, Apr. 6, 1973, 2317225
Int. Cl.² A01N *9/26, 9/30*
U.S. Cl. 424—346 **8 Claims**

1. A liquid concentrate for killing parasitic spores and eggs in livestock stalls comprising from 10% to 40% by weight of a disinfectant selected from the group consisting of phenol, p-chloro-m-cresol, cresol, o-phenyl-phenol, pentachlorophenol and hexachlorophene and a solvent combination which penetrates the membranes of parasitic spores and eggs consisting essentially of perchloroethylene and a monohydroxy alcohol having 2 to 4 carbon atoms; said liquid concentrate containing from 10% to 50% by weight of said perchloroethylene, from 25% to 50% by weight of said alcohol; and in addition containing from 0% to 40% by weight of a surface-active compound.

3,932,685

ALUMINUM STABILIZATION PROCESS AND STABILIZATION SOLUTION THEREFOR

Dervin L. Flowers, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Nov. 9, 1973, Ser. No. 414,587
Int. Cl.² B05D *3/00;* **C09D** *5/00*
U.S. Cl. 427—352 **4 Claims**

1. In a process of manufacturing aluminum parts which are to be bonded to other parts, the improvement which comprises the step of coating the aluminum parts with a complex solution containing 1 to 30 grams per liter phosphorous pentoxide, 1 to 60 grams per liter boric anhydride, 0.01 to 10.0

grams per liter of a material elected from the group consisting of gold, platinum, palladium and rhodium salts and oxides.

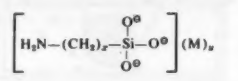
3,932,686

BINDER COMPOSITION

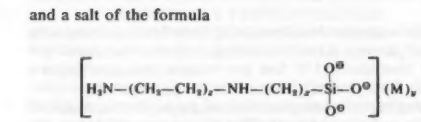
Kevin M. Foley, Hebron, and Frank P. McCombs, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 13, 1974, Ser. No. 523,386
Int. Cl.² B32B 5/16
U.S. Cl. 428—268 9 Claims

1. A mass of intermeshed vitreous fibers bonded to one another at points of contact by a thermoset phenolic resin binder which is the product of heat curing of a composition containing a phenolic resin and a silanolate salt selected from the group consisting of a salt of the formula



and a salt of the formula



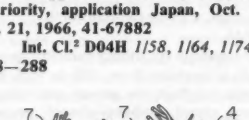
where M is a metal having a valence of up to 2, y is equal to 3 divided by the valence of the metal, x is an integer from 3 to 6 and z is an integer from 1 to 3.

3,932,687

FIBROUS CONFIGURATION COMPOSED OF A PLURALITY OF MUTUALLY ENTANGLED BUNDLES OF FINE FIBERS

Miyoshi Okamoto; Koji Watanabe, both of Otsu; Yasuhiko Nukushina, Kyoto, and Makoto Konosu, Otsu, all of Japan, assignors to Toray Industries, Inc., Japan

Continuation of Ser. No. 97,328, Dec. 11, 1970, abandoned, which is a continuation of Ser. No. 675,823, Oct. 17, 1967, abandoned. This application Mar. 26, 1973, Ser. No. 344,620
Claims priority, application Japan, Oct. 17, 1966, 41-68903; Oct. 21, 1966, 41-67882
Int. Cl.² D04H 1/58, 1/64, 1/74
U.S. Cl. 428—288 4 Claims



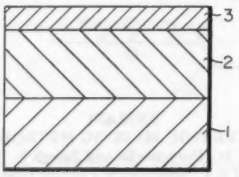
1. A fibrous article comprising: numerous staple fiber bundle units mutually entangled with one another in a three-dimensional configuration, each said staple fiber bundle unit comprising a plurality of flexible and relatively movable synthetic organic ultrafine fibers having a denier within the range of 0.005 to 0.5 denier per one ultrafine fiber, substantially the same fiber length and lying axially along the longitudinal axis of said staple fiber bundle unit; elastic bonding material disposed around and spaced axially along said ultrafine fiber bundle units joining together adjacent ones of said ultrafine fiber bundle units at locations where they intersect with one another to hold the entangled ultrafine fiber bundle units in said three-dimensional configuration while permitting slight relative longitudinal movement between the individual ultrafine fibers within each ultrafine fiber bundle unit; and wherein the ultrafine fibers located on at least one surface of said fibrous article have raised ends which are spaced-apart from each other.

3,932,688

COMPOSITE MAGNETIC FILM

Yutaka Sugita, Tokorozawa; Tsutomu Kobayashi; Hideki Nishida, both of Tokyo, and Masatake Takahashi, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 12, 1973, Ser. No. 405,839
Int. Cl.² H01F 10/00
U.S. Cl. 428—336 17 Claims



1. A composite free from development of hard bubbles comprising a magnetic bubble domain film capable of forming hard bubbles and having its easy magnetization axis arranged in a direction perpendicular to the surface thereof and in which uniaxial anisotropy is dominant, and a polycrystalline metallic ferromagnetic film deposited on said magnetic film, said polycrystalline film having a thickness of 30 to 500 angstroms.

3,932,689

FLEXIBLE ADHESIVE COMPOSITION AND METHOD FOR UTILIZING SAME AND ARTICLE FORMED THEREFROM

Tsutomu Watanabe; Sigenori Yamaoka, and Kochi Tanaka, all of Yokohama, Japan, assignors to Sumitomo Bakelite Company, Limited, Tokyo, Japan

Filed Feb. 21, 1974, Ser. No. 444,263
Claims priority, application Japan, Oct. 13, 1973, 48-114353; Oct. 29, 1973, 48-120736
Int. Cl.² C09J 3/14, 3/16
U.S. Cl. 428—418 30 Claims

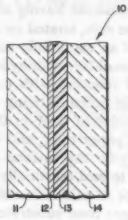
1. An adhesive composition for flexible printed circuits comprising a mixture of (1) a fusible and soluble phenol-formaldehyde resin, (2) a polyepoxy compound having at least two epoxy groups in its molecule, (3) at least one polymer selected from the group consisting of acrylonitrile-butadiene copolymers and polyvinylacetal resins, and (4) at least one copolymer selected from the group consisting of (a) partial alkyl esters of copolymers of aromatic vinyl compounds and maleic anhydride, (b) copolymers of aromatic vinyl compounds and alkyl maleates, and (c) copolymers of aromatic vinyl compounds, maleic anhydride, and alkyl maleates.

20. A method for manufacturing a metal-clad laminate for flexible printed circuits, which comprises interposing the adhesive composition according to claim 2 between a plastic film and a metal foil, passing the resulting assembly between a pair of pressing rolls of a laminating equipment, one of the rolls being a metal roll and the other being a rubber roll, in such a manner that the plastic film and the metal foil contact with the metal roll and the rubber roll, respectively, and the metal foil is allowed to wrap around the rubber roll from the position on the circumference of the rubber roll for $\pi/4$ or more radians toward the contact line of both rolls, and effecting the bonding by application of heat and pressure while passing through said pair of pressing rolls.

3,932,690
TRANSPARENT, PHOTOTROPIC LAMINATE

Georg Gliemeroth, Mainz-Finthen, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed Apr. 29, 1974, Ser. No. 464,963
Claims priority, application Germany, Apr. 30, 1973, 7316334
Int. Cl.² B32B 17/06
U.S. Cl. 428—432 8 Claims



1. A transparent laminate that passes less light in the presence of actinic light than in the absence of actinic light, said laminate comprising:

A. a light-transmitting substrate selected from the group consisting of glass and transparent plastic sheet;

B. a light-transmitting phototropic layer consisting essentially of silver halides and copper halides which darkens in the presence of actinic light said phototropic layer being attached to the substrate;

C. a light-transmitting plastic sheet layer attached to the phototropic layer.

3,932,691
METHOD OF INSULATING ROTOR PLATES

Joseph Danzer, and Helmut Weber, both of Munich, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Continuation-in-part of Ser. No. 118,984, Feb. 25, 1971, abandoned. This application Oct. 5, 1973, Ser. No. 403,754
Claims priority, application Germany, Mar. 3, 1970, 2009906
Int. Cl.² B32B 15/04; B05D 3/04
U.S. Cl. 428—450 11 Claims

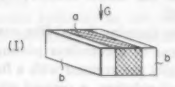
1. An improved method for insulating iron rotor plates for an electric motor in which the electric conductor consists of bare aluminum by contacting decarbonized and degreased rotor plates with steam at a temperature of from 350° to about 950°C. until a blue iron-oxide film is formed, the improvement which comprises coating said plates with a composition containing an organosilicon material and an organic solvent and thereafter drying the coated plates before contacting the plates with steam.

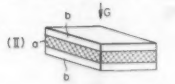
3,932,692
RESINIOUS LAMINATES HAVING IMPROVED GAS PERMEATION AND DELAMINATION RESISTANCE

Sadao Hirata; Syunsaku Hirata, both of Yokohama; Toru Suzuki, Yokosuka, and Akira Kishimoto, Tokyo, all of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Aug. 20, 1973, Ser. No. 389,791
Claims priority, application Japan, Aug. 20, 1972, 47-83157; July 7, 1973, 48-76138
Int. Cl.² B32B 27/08; C08G 41/04
U.S. Cl. 428—474 17 Claims

1. A resin laminate structure having an improved gas permeation resistance and high resistance to delamination formed by means of co-extrusion of plurality of resin melts, which structure comprises a layer of a polyolefin and a layer of a blend consisting essentially of (A) a saponified product of an ethylene-vinyl acetate copolymer having an ethylene content of 25 to 50 mole % and a degree of saponification of at least 96% and (B) a thermoplastic polymer containing a carbonyl group in the main or side chain thereof, at an A : B mixing weight ratio ranging from 95:5 to 50:50, said two layers being laminated so that said two layers are adjacent to each other, wherein said blend layer has such a multi-layer laminar structure that the polymer composition is different with respect to the thickness direction but substantially identical with respect to the plane direction and that when the blend layer is divided into three layers in the direction of the thickness, the divided layer adjacent to said polyolefin layer contains predominantly said carbonyl group-containing thermoplastic polymer, namely contains said saponified product in an amount expressed by the following formula





$$M_1 = m_1 X$$

wherein X stands for the average content (% by weight) of the ethylene-vinyl acetate copolymer saponified product in the blend layer, m_1 is a number of from 0 to 0.95 and M_1 is the content (% by weight) of said saponified copolymer in said divided layer adjacent to the polyolefin layer, and at least one layer of the divided layers other than the divided layer adjacent to the polyolefin layer contains said ethylene-vinyl acetate copolymer predominantly, namely in an amount of expressed by the following formula

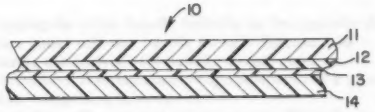
$$M_2 = m_2 X$$

wherein X is as defined above, M_2 is the content (% by weight) of said saponified copolymer in said specific divided layer, and m_2 is a number of from 1.2 to 4.

3,932,693
LAMINATED PACKAGING FILM HAVING LOW VAPOR AND GAS PERMEABILITY

Fred B. Shaw, Hinsdale, and Richard E. Graumann, Blue Island, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 81,941, Oct. 19, 1970, abandoned. This application June 3, 1974, Ser. No. 475,466
Int. Cl.² B32B 27/08
U.S. Cl. 428—518 4 Claims



1. A laminated, heat sealable film having low oxygen and water vapor permeability comprising

a. a base layer, of an oriented polypropylene film

b. a thin continuous layer of a vinylidene chloride polymer containing at least 75 weight percent vinylidene chloride bonded to one surface of the base layer,

c. a thin continuous layer of a first ethylene/vinyl acetate copolymer bonded to the vinylidene polymer layer, the first ethylene/vinyl acetate copolymer having a vinyl acetate content greater than 10 to about 30 percent by weight, and

d. a top layer of a second ethylene/vinyl acetate copolymer having a vinyl acetate content of about 2.5 to 7.5 percent

by weight bonded to the first ethylene/vinyl acetate copolymer layer.

3,932,694

PRE-TREATMENT METHOD FOR ELECTROLESS PLATING FOR PRODUCING A METAL FILM AS RESISTOR

Hachiro Hamaguchi, Nara, and Hiroshi Takahama, Osaka, both of Japan, assignors to Tatsuta Densen Kabushiki Kaisha, Japan

Filed Apr. 4, 1974, Ser. No. 458,018
Int. Cl.² B05D 5/12, 3/04, 3/10
U.S. Cl. 428—432 7 Claims

1. A method for forming metal film resistor on nonmetallic substrate by means of electroless plating, wherein said substrate is sequentially pre-treated with a first stannous chloride solution, silver salt solution, a second stannous chloride solution and further with palladium chloride solution and then forming a metal film resistor on said pre-treated substrate by electroless plating.

3,932,695

REACTANT SHEET FOR DEVELOPING COLORLESS DYE IMAGES

Gerald T. Davis, and Robert A. Fetters, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Jan. 23, 1967, Ser. No. 610,766
Int. Cl.² B32B 27/08, 27/42; B41M 3/12, 5/00
U.S. Cl. 428—531 3 Claims

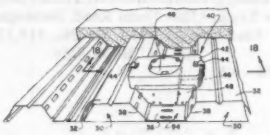
1. A reactant sheet for use in developing a colored image from a colorless image formed by application of a colorless dye dissolved in a carrier liquid, which comprises a pigment coated paper base substrate having an adherent layer of pigment particles on one side, coated on said side with a uniform coating consisting of an essentially solid, non-volatile, water-insoluble, fusible phenol-formaldehyde condensation polymer which is capable of reacting with colorless dyes to form a colored material, said polymer being applied to said paper in an amount of the order of 0.01 to 0.2 pounds of solids per 1300 square feet of paper base, and said polymer being substantially completely on the surface of said paper base substrate and adherent to and essentially completely retained on the exposed surfaces of said adherent layer of said pigment particles on said paper base substrate.

ELECTRICAL

3,932,696
UNDERFLOOR ACCESS HOUSING UTILIZING A TROUGH SPACE OF A CELLULAR FLOORING UNIT

Frank W. Fork, Allison Park; Robert G. Lindner, Sewickley; Charles J. Kelly, Pittsburgh, and Raymond E. Albrecht, Sewickley, all of Pa., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Filed Dec. 26, 1973, Ser. No. 427,507
Int. Cl.² H02G *3/28*
U.S. Cl. 174—48 37 Claims



1. In an electrical wiring distributing floor structure including cellular flooring units providing generally parallel enclosed cells, each pair of adjacent cells presenting spaced crests separated by a trough, each said trough comprising a valley and confronting inclined webs connecting said valley to said spaced crests, an access housing fixed to the flooring unit and spanning the distance between said spaced crests, said access housing having perimeter walls, and a top wall provided with an outlet opening, the improvement comprising:

distinct trough closures, one positioned along each side of said access housing and cooperating with a valley segment and confronting web segments to define a trough space accessible through said outlet opening; and

each of said confronting web segments having a web access opening establing communication between each cell of said adjacent cells and said trough space.

3,932,697
ROPE TERMINATIONS AND METHODS AND APPARATUS FOR FABRICATING THE SAME

Henry Alexander Hood, Moorestown, N.J., assignor to Wall Industries, Inc., Beverly, N.J.

Filed July 29, 1974, Ser. No. 492,721
Int. Cl.² H02G *15/02, 1/14;* F16G *11/00*
U.S. Cl. 174—79 9 Claims

1. A termination of a length of rope having a plurality of rope yarns, comprising:

a termination fitting having an inner end,

fastening means carried by said fitting remote from said inner end,

said fitting having a peripheral surface with a curved portion remote from said inner end and diametrically-opposed portions tapering outwardly from said inner end,

said rope having a main section with said yarns closely associated with one another and an end section with said yarns separated into at least a pair of bundles,

said bundles extending outwardly around the curved portion of said peripheral surface and returning along said diametrically-opposed portions of said peripheral surface,

one of said pair of bundles being wrapped helically in one direction about the main section of the rope and the other of said bundles being wrapped helically in the opposite direction about said one bundle,

said bundles being wrapped for a predetermined distance along said main section of the rope and having ends, and

means securing said ends to the main section of said rope,

whereby the application of tension between the main section of the rope and the fastening means of the fitting causes the wrapped bundles to grip the rope for securely mounting the fitting thereto.

8. A method of terminating a rope composed of a plurality of yarns, comprising the steps of:

associating with one end of the rope a fitting having a frusto-conical peripheral surface with a base and an axial bore,

disposing the fitting with its narrow end toward the end of the rope,

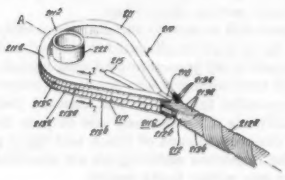
separating the rope yarns into at least one pair of bundles,

inserting the bundles axially into the bore at the narrow end of the fitting,

splaying the bundles diametrically outward around the base of the fitting,

disposing the bundles axially along opposite sides of the peripheral surface,

wrapping one bundle helically in one direction about the rope inwardly of the fitting for a predetermined distance,



wrapping the other bundle helically in the opposite direction about said one bundle for said distance, and

securing the ends of said bundles to said rope.

9. A method of terminating a rope composed of a plurality of yarns, comprising the steps of:

associating with one end of the rope a fitting having an outwardly-open channel disposed in the form of a loop having a narrow end,

disposing the narrow end of the loop adjacent the end of the rope,

separating the rope yarns into at least one pair of bundles,

extending one bundle in one direction around said loop in said channel,

extending the other bundle in the other direction around said loop in said channel,

wrapping one bundle helically about the rope in one direction for a predetermined distance,

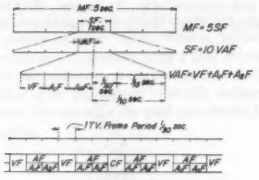
wrapping the other bundle helically about the rope in the other direction for said distance, and

securing the ends of the bundles to the rope.

3,932,698
MULTIPLEX SIGNAL TRANSMISSION SYSTEM

Akio Yanagimachi, Kawasaki; Osamu Yamada, Kodaira; Hisakichi Yamane, Tokyo; Eiichi Sawabe, Machida; Takashi Uehara, Inagi; Takehiko Yoshino, Yokohama; Teruhiro Takezawa, Komae; Michio Masuda, Tokyo; Hiroaki Nabeyama, Yokohama; Masaaki Fukuda, Kodaira, and Tatsuo Kayano, Hachioji, all of Japan, assignors to Nippon Hoso Kyokai; Hitachi, Ltd. and Hitachi Electronics, Ltd., all of Tokyo, Japan

Filed Aug. 27, 1973, Ser. No. 391,977
Claims priority, application Japan, Sept. 4, 1972, 47-88554
Int. Cl.² H04N 7/08
U.S. Cl. 178—5.6 **21 Claims**



1. A multiplex signal transmission system in which a multiplexed signal composed of several video signals and accompanied PCM-TDM audio signals, said audio signals being multiplexed in time division in the form of pulse code modulation signals having respectively arbitrary time durations and arranged in time-serial form, is sequentially divided into a plurality of signal portions contained in one master frame, said one master frame having several sub-frames, each of which includes a plurality of video-audio frames, each of which includes a video frame and an audio frame which has first and second frames, and in which said signal portions are respectively allocated to a plurality of time-parallel channels, each of which has a time duration of one master frame, and said signal portions being transmitted through respective ones of said plurality of time-parallel channels, repeatedly every one master frame period, comprising:

a channel shift means for shifting sequentially the whole of said signal portions allocated to each of said time-parallel channels every predetermined time period; and

a signal transmitting means applied to outputs derived in time-parallel form from said channel shift means and transmitting simultaneously said outputs through respective channels to each of which said signal portions composing respective audio signals are allocated successively every one master frame period,

said channel shift means being provided with

a shift register for temporarily storing input PCM-TDM audio signals during one frame period of said pulse code modulation signals,

a first ring counter to which the PCM-TDM audio signals thus stored in said shift register are transferred in parallel and which circulates the stored audio signals at intervals of one bit clock period of said pulse code modulation signals,

a second ring counter, having counter stages corresponding to the number of channels of said PCM-TDM audio signals contained in one frame period of said pulse code modulation signals, for circulating signals stored initially in said second ring counter at intervals of one master frame period, and

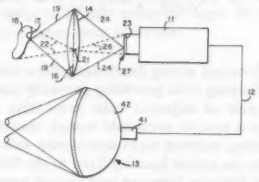
an AND gate group having AND gates the number of which is equal to that of said channels, and each of which has two input terminals connected respectively to output terminals of counter stages corresponding to a position of a first bit in each word of said pulse code modulation signals stored in said first ring counter and to output terminals of counter stages of said second ring counter, positions of which stages correspond to relevant words of said pulse code modulation signals, whereby

said AND gates sequentially become conductive during one master frame period in accordance with stepping of the content stored initially in said second ring counter at intervals of one master frame period so as to derive the PCM-TDM audio signals which circulate in said first counter through relevant AND gates which thus become conductive in such a manner that channels assigned to the PCM-TDM audio signals thus derived from AND gates sequentially conducting are shifted sequentially.

3,932,699
THREE-DIMENSIONAL TELEVISION

R. Maurice Tripp, 15231 Quito Road, Saratoga, Calif. 95070

Filed Nov. 26, 1973, Ser. No. 419,123
Int. Cl.² H04N 9/54
U.S. Cl. 178—6.5 **20 Claims**



1. Apparatus for viewing a three-dimensional scene and providing a manifestation of the depth relationships therein comprising: a radiation sensing means having a radiation responsive surface area and means for converting radiation received by said surface area into a transducer signal representative of both the intensity of said radiation and the locations on said surface area at which said radiation is received; focusing lens means for receiving radiation from said scene at a multiplicity of locations having different angles of view of each point in said scene and focusing the same from said multiplicity of locations to a composite image at a focal plane of said focusing lens means; and dispersing lens means for receiving the radiation focused to said composite image from said multiplicity of locations and dissecting the same into a plurality of image elements of each point in said scene corresponding to said different viewing angles of said scene and thereafter projecting each of said image elements to a location uniquely associated therewith on the radiation responsive surface area of said sensing means, the location on said radiation responsive surface area for each of said image elements being different from the locations thereon for the other of said image elements.

3,932,700
FOCUS TRACKING REGISTRATION FOR OPTICAL REPRODUCING SYSTEMS

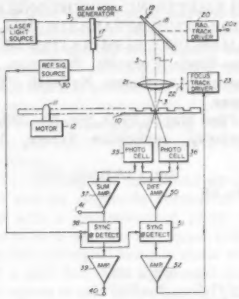
Paul A. Snopko, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Feb. 4, 1974, Ser. No. 439,657
Int. Cl.² H04N 5/76; G11B 11/18
U.S. Cl. 178—6.6 R **8 Claims**

1. In an optical reproducing system having an information signal stored in a track on a carrier to be derived by reading the storage track with a focused reading beam of energy, which system includes means for effecting periodic lateral relative displacement of said beam with respect to said track at a predetermined wobble frequency to develop a radial tracking error signal and means responsive to said radial error signal to maintain radial tracking registration of said track and said beam, the improvement which comprises a focus tracking arrangement having:

a pair of photoreceptors disposed on opposite sides of a reference plane that includes (a) the optical axis of said reading beam during conditions of radial tracking registration and (b) the tangent of the storage track;

means for differentially combining the output signals of said photoreceptors to develop, during operating intervals in which said beam and said carrier are out of focus registration, a focus error signal of said wobble frequency having



a phase related to the sense of focus misregistration and magnitude related to the extent of misregistration;

a synchronous phase detector;

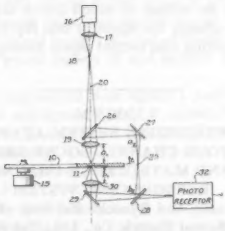
means for supplying to said detector said focus error signal and a reference signal phase synchronized to the periodic displacement of said beam to develop a focus tracking signal; and

means responsive to said focus tracking signal for maintaining said beam and carrier in focus registration.

3,932,701
SELF-COMPENSATING FOCUS SYSTEM FOR A REFLECTIVE VIDEO DISC

Robert Adler, Northfield, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 29, 1975, Ser. No. 545,072
Int. Cl.² H04N 5/76
U.S. Cl. 178—6.6 R **9 Claims**



1. A self-compensating focus system for an optical video playback device for reading a program record which is reflective to a beam of energy, said record having one surface that is a plain reflector and an opposite surface through which a reading beam may gain access to information stored in said record, said system comprising:

means, including a first objective lens disposed across a first optical path, for focusing a reading beam of energy on said one surface of said record;

means, including a plurality of at least partially reflecting surfaces, for directing energy reflected from said one surface of said record and returned through said first lens along a second optical path to an intermediate focus and then to the opposite surface of said record;

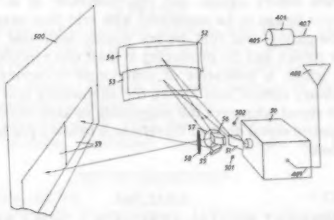
means, including a second objective lens disposed across said second optical path, for imaging said intermediate focus onto said opposite surface of said record, the magnification factor of said first lens being related to the magnification factor of said second lens so that changes in the spacing of said one surface relative to said first lens produce compensating changes in the spacing of said intermediate focus relative to said second lens so that said reading beam remains focused on said opposite surface of said record; and

means responsive to energy from said reading beam reflected from said opposite surface of said record for developing an output signal representing information stored in said record.

3,932,702
OPTICAL SYSTEM FOR THE DISPLAY OF VISUAL IMAGES

Melville Leslie Shelley, Lindfield, and Archer Michael Spooner, Henley-on-Thames, both of England, assignors to Redifon Limited, London, England

Filed Nov. 29, 1972, Ser. No. 310,533
Claims priority, application United Kingdom, Dec. 13, 1971, 57699/71
Int. Cl.² H04N 7/18
U.S. Cl. 178—6.8 **12 Claims**



1. An optical display system, for the projection of visual images onto a viewing screen, comprising a first optical imaging system for viewing an object and providing a first image having a first format, a second optical imaging system including refracting optical elements for dissecting said first image into a plurality of rectangular picture areas and for relatively rearranging the said rectangular picture areas to provide a second sole image having a second format different from said first format, television scanning means for viewing the said second image and providing a third image, substantially reproducing said second image parts and having substantially the same (second) format, and a third optical imaging system including refracting optical elements for viewing the said third image for dissecting said third image into the same said rectangular picture areas and for projecting a fourth image substantially reproducing the said first image and having substantially the same (first) format.

3,932,703

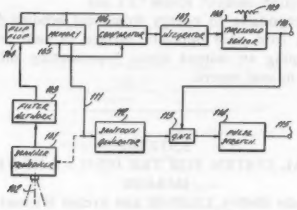
IMAGE MOTION AND CHANGE TRANSDUCERS AND SYSTEMS CONTROLLED THEREBY

Emil J. Bolsey, White Plains, N.Y. 10606

Continuation-in-part of Ser. No. 193,950, Oct. 29, 1971, Pat. No. 3,823,261, which is a continuation-in-part of Ser. No. 778,870, May 27, 1968, Pat. No. 3,617,016, which is a continuation-in-part of Ser. No. 118,194, June 9, 1961, abandoned. This application July 8, 1974, Ser. No. 486,065

Int. Cl.[2] H04N 7/18

U.S. Cl. 178—6.8 2 Claims



1. Apparatus for comparing arbitrary images comprising, in combination: scanning means for scanning a selected area of a first arbitrary image, said means operating cyclically to provide at least one scan having a given video pattern, photosensitive means cooperating with said scanning means for changing each said video pattern into video electrical signals which are respectively the analogs of said video patterns, frequency-selective filtering and amplifying means for emphasizing the components of said video electrical signals which fall within an intermediate frequency range, quantizing means cooperating with said filtering and amplifying means for converting the electrical signals produced thereby into first binary signals, a source of reference binary signals comparable with said first binary signals and representative of at least one reference image to be compared with said first image, means for comparing said first binary signals with said reference binary signals and for producing at least one electrical output signal which is indicative of differences occurring between said binary signals, and means for attenuating said electrical output signal whenever the magnitude of said video signal or of a control signal derived therefrom is below a predetermined threshold.

3,932,704

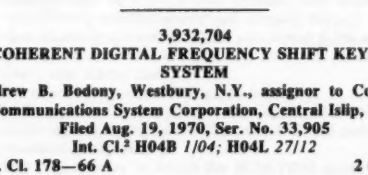
COHERENT DIGITAL FREQUENCY SHIFT KEYING SYSTEM

Andrew B. Bodony, Westbury, N.Y., assignor to Coherent Communications System Corporation, Central Islip, N.Y.

Filed Aug. 19, 1970, Ser. No. 33,905

Int. Cl.[2] H04B 1/04; H04L 27/12

U.S. Cl. 178—66 A 2 Claims



1. In a frequency shift signal generator, the combination of;

a source of stable high frequency signals;

a programmable variable ratio frequency divider coupled to said source;

programmable multicircuit selection means connected to said divider for selecting any pair of programmable divider ratios from a great plurality of possible predetermined programmable ratios;

keying signal responsive gating means coupled to said selection means for alternating said divider ratio between the two ratios comprising a selected pair in response to binary mark and space keying pulses;

means for applying keying signals to said gating means; and output means coupled to said frequency divider.

3,932,705

PSK TELEMETERING SYNCHRONIZATION AND DEMODULATION APPARATUS INCLUDING AN AMBIGUITY ELIMINATING DEVICE

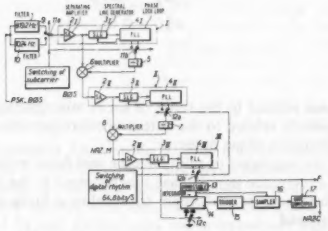
Vianney Jean-Marie Corneille Wulleman, Soisy-sur-Seine, France, assignor to Centre National d'Etudes Spatiales, Paris, France

Filed May 9, 1973, Ser. No. 358,499

Claims priority, application France, May 10, 1972, 72.16867

Int. Cl.[2] H04L 7/06

U.S. Cl. 178—68 9 Claims



5. A spectral line generator for extracting from an input signal at a given frequency, which input signal carries no energy at said frequency, an output signal with energy at said frequency, which comprises: shift register means which comprises a series of cascade connected flip-flops for delaying said input signal; means for multiplying said input signal with a delayed version thereof as supplied by said shift register means; and means for driving said shift register which comprises a phase locked loop which receives as an input signal the output from said multiplying means, said loop including dividing means an output of which drives said shift register means so as to change the states of said flip-flops and output means for delivering said output signal having energy at said frequency.

3,932,706

SIGNAL SYNTHESIZING SYSTEM ADAPTABLE FOR DISCRETE FOUR-CHANNEL SOUND REPRODUCING SYSTEM AND MATRIX FOUR-CHANNEL SOUND REPRODUCING SYSTEM

Susumu Takahashi, and Ryosuke Ito, both of Tokyo, Japan, assignors to Sansui Electric Co., Ltd., Tokyo, Japan

Filed May 25, 1973, Ser. No. 364,115

Claims priority, application Japan, May 31, 1972, 47-53951

Int. Cl.[2] H04R 5/00

U.S. Cl. 179—1 GQ 5 Claims

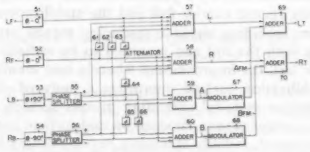
1. A signal synthesizing system for forming first and second recording or transmission signals from first, second, third and fourth sound signals LF, RF, LB and RB, said first recording or transmission signal containing a first main signal L and a first sub-signal A, said second recording or transmission signal containing a second main signal R and a second sub-signal B, said first and second main signals being adapted for a matrix

four-channel reproduction system, and said first and second main signals and said first and second sub-signals being adapted for a discrete four-channel reproduction system; said synthesizing system comprising:

first means for combining said first sound signal, an amplitude portion of said second sound signal, said third sound signal and an amplitude portion of said fourth sound signal with a predetermined phase relationship therebetween to form said first main signal;

second means for combining an amplitude portion of said first sound signal, said second sound signal, an amplitude portion of said third sound signal, and said fourth sound signal with a predetermined phase relationship therebetween to form said second main signal, said first and second sound signals in said second main signal being in phase with said first and second sound signals in said first main signal, respectively, and said third and fourth sound signals in said second main signal being 180° out of phase with said third and fourth sound signals in said first main signal, respectively;

third means for combining said first sound signal, said third sound signal and an amplitude portion of said fourth sound signal with a predetermined phase relationship therebetween to form said first sub-signal, said first sound signal in said first sub-signal being in phase with said first sound signal in said first main signal, and said third and fourth sound signals in said first sub-signal being 180° out of phase with said third and fourth sound signals in said first main signal, respectively



fourth means for combining said second sound signal, an amplitude portion of said third sound signal, and said fourth sound signal with a predetermined phase relationship therebetween to form said second sub-signal, said second sound signal in said second sub-signal being in phase with said second sound signal in said second main signal, and said third and fourth sound signals in said second sub-signal being 180° out of phase with said third and fourth sound signals in said second main signal, respectively;

with said first and second main signals L and R and said first and second sub-signals A and B related to said first to fourth sound signals LF, RF, LB and RB according to the following equations

$$L = LF + \Delta RF + jLB + J\Delta RB,$$
$$R = RF + \Delta LF - jRB - j\Delta LB,$$
$$A = LF - jLB - J\Delta RB \text{ and}$$
$$B = RF + jRB + j\Delta LB$$

where Δ represents a matrix coefficient ranging from 0 to 1;

fifth means for frequency-modulating a first carrier signal in accordance with said first sub-signal;

sixth means for frequency-modulating a second carrier signal in accordance with said second sub-signal;

means for adding said first main signal and the frequency-modulated first carrier signal to produce said first recording or transmission signal; and

means for adding said second main signal and the frequency-modulated second carrier signal to produce said second recording or transmission signal.

3,932,707

ELECTRIC IMPULSE TRANSMITTERS FOR TELEPHONE INSTRUMENTS

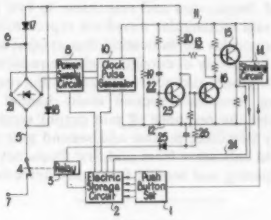
David Charles Anthony Connolly, 26 Eden Grove, Middridge, Shildon, Durham, and Per Jorgen Hovland, 254 Scholar's Park, Newton Aycliffe, Durham, both of England

Filed Oct. 25, 1974, Ser. No. 517,952

Claims priority, application United Kingdom, Oct. 25, 1973, 49698/73

Int. Cl.² H04M 1/50

U.S. Cl. 179—16 AA **7 Claims**



3. An electric impulse transmitter for a push-button telephone instrument comprising electric storage means, means for entering digit values in said storage means as selected by operation of respective push-buttons of the instrument, electric impulse generator means for generating trains of impulses representative of digit values stored in said storage means, first electric circuit means responsive to line current flowing to the instrument, and further electric circuit means responsive to said trains of impulses and to an output from said first circuit means to provide a clearing signal for said storage means upon cessation of line current to the instrument other than due to signalling of said impulses.

3,932,708

FREQUENCY-SELECTIVE SIGNAL RECEIVER FOR COMMUNICATION EQUIPMENTS, MORE PARTICULARLY TELEPHONE EQUIPMENTS

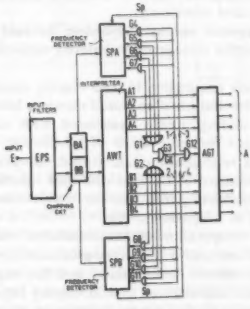
Klaus-Dieter Rother, Planegg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 20, 1973, Ser. No. 399,337

Claims priority, application Germany, Sept. 28, 1972, 2247575

Int. Cl.² H04M 1/50

U.S. Cl. 179—84 VF **7 Claims**



1. A telephone equipment frequency-selective signal receiver for receiving a multi-frequency group code having means for detecting signals including other than certain desired frequencies, wherein the signals received comprise several simultaneously occurring single frequencies, said received

signals being applied to clipping means for conversion to a rectangular waveform, said receiver including first frequency detection means having a broad bandwith frequency detector for each desired frequency of said group and responsive to said simultaneously occuring single frequencies in said rectangular waveform for detecting said single frequencies in said received signal and indicating the occurrence of at least one desired frequency, an output section having an activating gate coupled to the output of said first frequency detecting means and responsive to said indication from said first frequency detecting means, second multi-channel detection means having a narrow bandwidth frequency detector assigned to each of said desired frequencies and responsive to two successive half-cycles of said rectangular waveform representing each of said single frequencies for indicating that at least one of said received simultaneously occurring single frequencies is not a member of said group, said activating gate being responsive to said indication from said second multi-channel detection means to inhibit the response of said output section to said first frequency detecting means, and second gate means responsive to said indication from said first frequency detection means for actuating said second frequency detection means.

3,932,709

ELECTRONIC BUSINESS TELEPHONE

Don G. Hoff, Tiburon, and Patrick Young, Oakland, both of Calif., assignors to General Teletronics Incorporated, San Francisco, Calif.

Continuation-in-part of Ser. No. 351,745, April 16, 1973, abandoned. This application Mar. 7, 1974, Ser. No. 449,155

Int. Cl.² H04M *11/00*

U.S. Cl. 179—90 K **17 Claims**

1. An electronic communications terminal comprising:
a. keyboard means for entry of numeric information and function control commands;
b. displaya register means responsive to said keyboard means for buffer storage of so entered numeric information;
c. display means responsive to said display register means for visual presentation of so stored numeric information;
d. automatic dialing means associated with said display register means for generation of telephonic call placement signals representing said stored numeric information under control of at least one said function control commands indicating that said communications terminal is operating in telephone mode;
e. arithmetic computation means associated with said display register means for performing calculations involving said stored numeric information and for supplying the results of said calculations to said display register means for visual presentation under control of at least one of said function control commands indicating that said communications terminal is operating in computation mode; and
f. articulation means associated with said display register means and said display means for causing said stored numeric information to be displayed in a plurality of spaced segments only when the terminal is operating in the telephone mode.

3,932,710

RECORD DISC FOIL SUPPORT SYSTEM WITH CHARGE LEAKAGE MEANS

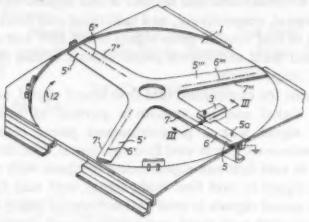
Gerhard Dickopp, and Benno Jahnel, both of Berlin, Germany, assignors to TED Bildplatten Aktiengesellschaft, AEG-Telefunken, TELDEC, Zug, Switzerland

Filed Apr. 2, 1974, Ser. No. 457,177

Claims priority, application Germany, Apr. 11, 1973, 2318870

Int. Cl.² G11B *9/08, 5/12;* H05F *3/00*

U.S. Cl. 179—100.4 R **12 Claims**



1. In a signal transducing system having a member defining a stabilization surface and arranged to cause a rotating record carrier foil to be held in the vicinity of the stabilization surface by a cushion formed by a gaseous medium flowing between the rotating record carrier foil and the stabilization surface, the system including signal transducing means arranged to cooperate with the foil and mounted to be radially movable across the foil, the improvement wherein said member defining a stabilization surface comprises a body of electrically nonconductive material extending to said surface, and said system comprises means disposed on said surface and presenting strip-shaped, radially extending regions having high electrical conductivity.

3,932,711

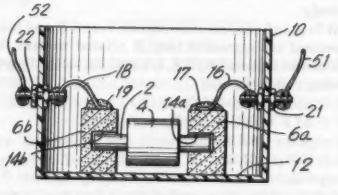
TRANSMISSION OF VOICE OR SOUND THROUGH TELEGRAPHY

Gerard J. O'Brien, deceased, late of Jersey City, N.J., by Catherine H. O'Brien, executrix, 33 Pamrapo Ave., Jersey City, N.J. 07307

Filed Sept. 13, 1973, Ser. No. 396,758

Int. Cl.² H04R *21/02*

U.S. Cl. 179—142 **16 Claims**



1. A transducer for converting a vibratory input into a train of direct-current pulses, comprising:
a soundboard sensitive to said vibratory input;
electrically conductive bearing means rigidly mounted on said soundboard and electrically insulated therefrom;
a conductive switching bar having an axis loosely engaged in said bearing means, a sufficient clearance being provided between said conductive switching bar and said

bearing means to permit movement of said conductive switching bar in directions transverse to the axis thereof; and

conductor means for interconnecting said bearing means with a direct-current power sorce, whereby said train of pulses are generated by motion of said switching bar in said bearing means upon the application of a vibratory input to said soundboard.

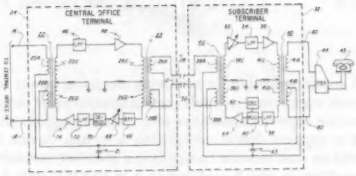
3,932,712
TELEPHONE TRANSMISSION SYSTEM

Morris A. Suntop, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Continuation of Ser. No. 262,816, June 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 139,734, May 3, 1971, abandoned. This application Feb. 7, 1974, Ser. No. 440,504

Int. Cl.² H04B *1/54, 1/58*

U.S. Cl. 179—170 R **8 Claims**



1. A telephone transmission system comprising

a first pair of terminals for connection to a telephone circuit;

a second pair of terminals for connection to a two-wire line which presents a first impedance at audio frequencies and a second impedance, which is substantially less than said first impedance, at a selected carrier frequency;

a communication circuit including first circuit means connected to said first pair of terminals for transmitting audio signals at audio frequencies from one pair of said first and second pairs of terminals to the other pair of said first and second pair of terminals, and second circuit means connected to said first pair of terminals for transmitting signals from one pair of said first and second pairs of terminals to the other pair of said first and second pairs of terminals in a direction opposite the transmission of said audio signals, said second circuit means including in series a first circuit for transmitting audio modulation carrier signals at carrier frequencies, a second circuit for transmitting audio signals at audio frequencies, and a signal converter circuit connected between said first and second circuits; and

third circuit means connecting said first and second circuit means to one end of said two-wire line via said second pair of terminals for producing an impedance match between said communication circuit and said two-wire line at said selected carrier frequency and producing a deliberate impedance mismatch between said communication circuit and said two-wire line at audio frequencies.

3,932,713
INDUCTION CANCELLATION CIRCUIT

Albert C. Fleuchaus, Wheeling, and Paul Shylo, Norridge, both of Ill., assignors to Cook Electric Company, Morton Grove, Ill.

Filed May 15, 1974, Ser. No. 470,074

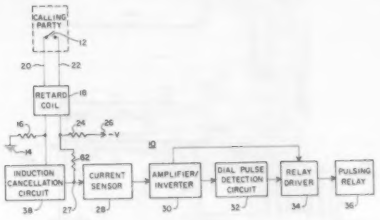
Int. Cl.² H04M *1/74*

U.S. Cl. 179—174 **7 Claims**

3. An induction cancellation circuit for use with a pair of telephone lines on which are induced AC signals, said induction cancellation circuit comprising:

a summing terminal external to said telephone lines,

an inverting amplifier having an input coupled to one of said telephone lines and having an output, said inverting amplifier converting the phase of said AC signals on said one telephone line substantially 180° so as to supply out of phase signals to said output,



a first resistor coupling said out of phase signals from said output to said summing terminal, and

a second resistor coupling said AC signals on said other telephone line to said summing terminal such that said out of phase signal and said AC signal substantially cancel each other at said summing terminal.

3,932,714
REMOTE ELECTRICAL TRANSMISSION SYSTEM

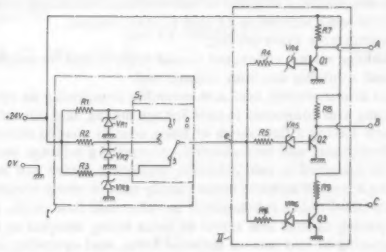
Jacques A. Guimier, Courtry, and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie, Paris, France

Filed Dec. 5, 1974, Ser. No. 530,032

Claims priority, application France, Dec. 13, 1974, 74.44558

Int. Cl.² H02G *11/02*

U.S. Cl. 191—12 R **4 Claims**



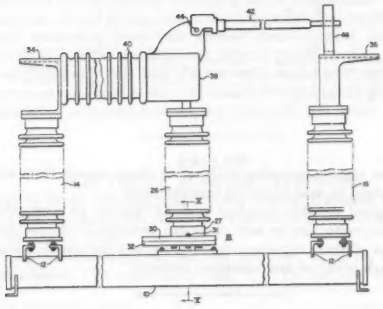
1. Device for the remote electrical transmission, via a single channel, of multiple orders from a single d.c. voltage, which comprises a control unit incorporating a selector switch connecting the transmission channel to anyone of a plurality of output circuits supplied with said single voltage but shunt-connected to respective Zener diodes having stepped reference voltages, and a receiver unit comprising transistors driven by circuit means supplied from said single channel through another set of Zener diodes, respectively, the reference voltage of these last-mentioned Zener diodes being stepped alternatively with respect to the voltages of the Zener diodes of said control unit, whereby said transistors will open or close different control circuits according to the position in which the control selector switch is set.

3,932,715

HIGH VOLTAGE SWITCH

Stanislaw A. Milianowicz, Monroeville, and Steven J. Swencki, Jr., Trafford, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 3, 1974, Ser. No. 466,745
Int. Cl.² H01H 31/00
U.S. Cl. 200—48 SB 6 Claims



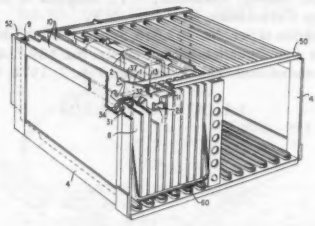
1. A high-voltage switch comprising:
a. separable contact means;
b. rotatable insulating means supporting said separable contact means, rotation of said rotatable insulating means producing separation of said contact means;
c. energizable drive means;
d. linkage means connected to said drive means for rotating said rotatable insulator means; and
e. an arm assembly, said arm assembly comprising an operating arm connected to said linkage means, said operating arm having a first series of holes equally spaced about a first circle, said arm assembly comprising a flange member attached to said rotatable insulating means and having a second series of holes equally spaced about a second circle of radius substantially equal to said first circle, the spacing of said first series of holes being unequal to the spacing of said second series of holes, said operating arm being attached to said flange member and so positioned that the centers of said first circle and said second circle are in axial alignment and at least two of said first series of holes are in axial alignment with at least two of said second series of holes to form at least two pairs of aligned holes symmetrically disposed about said circles, said arm assembly also comprising a plurality of means for securing said operating arm in fixed relationship to said flange member, each of said securing means extending through both holes of an aligned hole pair;
f. energization of said drive means producing movement of said linkage means to cause rotation of said rotatable insulating means and operation of said separable contact means, said symmetrical disposition of said aligned hole pairs about said circles causing rotational loads produced by energization of said drive means to be symmetrically imposed upon said flange member.

3,932,716

LATCH AND SWITCH ACTUATOR INTERLOCK SAFETY STRUCTURE FOR ELECTRONIC COMPONENT MODULE OPERABLE DURING INSERTION AND REMOVAL OF CONNECTOR MEMBERS

Samuel Mottel, New Providence, and David Howard Williamson, Whippany, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 15, 1974, Ser. No. 488,783
Int. Cl.² H01H 9/20
U.S. Cl. 200—50 A 12 Claims



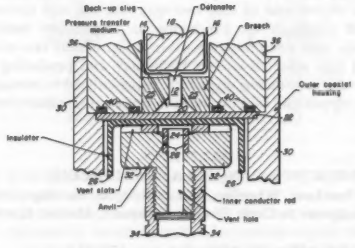
1. A switch assembly for removing electrical power from an electronic component module during insertion and removal of the module connector member with a mating connector member of a support frame comprising a switch device fixedly mounted on said module comprising a member movable to an OFF position in which said switch is in its OFF state for preventing electrical power from being applied to said module and movable to an ON position in which said switch is in its ON state for permitting electrical power to be applied to said module, a switch actuator pivotally mounted on said module and movably engaged with said switch device member for pivoting about said pivotal mount to a first position to move said switch device member to its ON position and for pivoting about said pivotal mount to a second position to move said switch device member to its OFF position, and means mounted on said module abutting against said support frame for restricting said actuator to its second position during insertion and removal of said module connector member to said frame connector member.

3,932,717

HIGH-EXPLOSIVE DRIVEN CROWBAR SWITCH

Robert S. Dike, and Ralph W. Kewish, Jr., both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

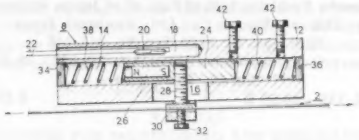
Filed Oct. 30, 1974, Ser. No. 519,325
Int. Cl.² H01H 39/00
U.S. Cl. 200—61.08 2 Claims



1. An explosive driven low inductance crowbar switch comprising:

a deformable driven plate **22** at a first potential;
a die plate **24** for shaping the deformation of driven plate **22** and for supplying a current joint edge;
an insulation layer **26** disposed between said driven plate **22** and said die plate **24**;
a conductive annular anvil **28** for establishing first arc contact with plate **22** and for stopping and establishing a press fit contact with said driven plate **22**; and
a detonator **12** and a pressure transfer medium **20** disposed adjacent driven plate **22** for selectively deforming a portion of said driven plate **22** and for driving said portion through insulation layer **26** first into arc contact with annular anvil **28**, second into physical contact against anvil **28**, and third into a press fit with die plate **24** and anvil **28**.

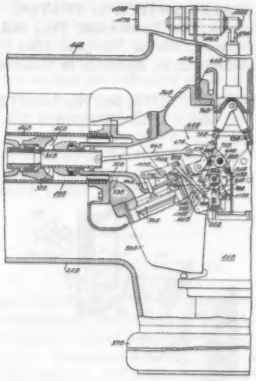
3,932,718
INTRUSION DETECTOR
Chaim Porat, Mivtza Chorev 21, Beersheba, Israel
Filed July 1, 1974, Ser. No. 485,045
Int. Cl.² H01H *3/02, 36/00*
U.S. Cl. 200—61.93 **9 Claims**



1. An intrusion detector comprising a housing attachable to a fixed support; an electrical switch fixed within the housing; said housing being formed with a longitudinal bore extending at least partly therethrough; a switch actuator movable within the longitudinal bore to actuate the switch; said actuator being attachable to a wire tensioned between the movable actuator and another fixed support so as to actuate the switch upon stretching or cutting the wire; a spring disposed within the bore in the housing, one end of the spring engageing said movable actuator to bias same in the direction opposite to said tensioned wire; and an adjustable closure member closing one end of said bore and engaging the opposite end of the spring to preset the initial non-actuating position of the actuator with respect to said switch.

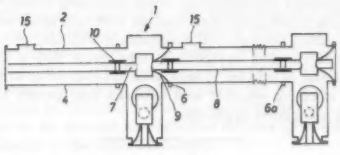
3,932,719
CIRCUIT BREAKER HAVING A SINGLE PULL-ROD OPERATING SYSTEM WITH A SELECTIVE TRIP-FREE CONTROL
Edwin C. Goodwin, Jr., Canton, and George K. Benham, Somerville, both of Mass., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Dec. 26, 1973, Ser. No. 428,257
Int. Cl.² H01H *33/82*
U.S. Cl. 200—148 **20 Claims**

1.
In a mechanism for mechanically actuating the separable contacts and associated blast valves of one or more gas insulated circuit breakers each having a gas insulated sealed enclosure in which the contacts and blast valves are operatively disposed, said circuit breaker including mechanical operating means within the sealed enclosure for mechanically operating the associated contacts and blast valves;
an external pull-rod mechanism supported externally of each of the enclosures of each circuit breaker;
drive means operably connected to be actuated by said pull-rod mechanism and extending from said external pull-rod mechanism into an associated circuit breaker enclosure in gas sealed relationship;
mechanical connecting means operably connected between the end of said drive means within a sealed enclosure and the associated circuit breaker contact and blast valve mechanical operating means for establishing a continuous operable mechanical connection between the external pull-rod mechanism and the internal circuit breaker contact amd blast valve mechanical operating means; and



control means remote from said external pull-rod operating mechanism and operably connected to control the operation of each of said external pull-rod operating mechanisms in a contact and blast valve opening and closing movement.

3,932,720
GAS-BLAST INSULATED, ENCAPSULATED HIGH-VOLTAGE SWITCHING INSTALLATION WITH REMOVABLE COLLECTING RAILS
Wilhelm Gaigg, and Vladimir Gutalj, both of Oberentfelden, Switzerland, assignors to Sprecher & Schuh AG, Switzerland
Filed Sept. 26, 1974, Ser. No. 509,731
Claims priority, application Switzerland, Sept. 28, 1973, 13907/73
Int. Cl.² H01H *33/54*
U.S. Cl. 200—148 R **11 Claims**



1. A gas-blast insulated, excapsulated high-voltage switching installation with removable bus bars, in which switching installation the installation components which comprise housings with flange connections and internal components secured in the form of partitions in such housings by means of conical supporting insulators form pressure gas tight compartments, and wherein the bus bars contain disconnectors as well as dilatation elements, the improvement comprising two oppositely situated connection flanges provided at each housing of the bus bar components, an internal conductor element arranged in each housing, the internal conductor elements bearing against one another and at least a number thereof being supported in their housing by an inwardly directed conical supporting insulator arranged at a connection flange, means for mechanically and electrically coupling the internal con-

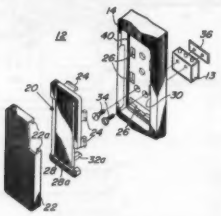
ductor elements with one another and each connection location being located beneath a flange connection, each housing containing a pressure gas tight closable mounting opening by means of which the connection location beneath the other free connection flange is accessible.

3,932,721

SEALED SWITCH ACTUATOR

Kenneth E. Crowell, Fort Lauderdale, Fla., and William M. Brettman, deceased, late of Margate, Fla., by Donna M. Brettman, administratrix, assignors to Motorola, Inc., Chicago, Ill.

Filed Feb. 3, 1975, Ser. No. 546,372
Int. Cl.² H01H *13/06*
U.S. Cl. 200—302 **6 Claims**



1. An improved, weather-resistant switch actuator arrangement for effecting a snap-type, flush-fit within a recess of the associated apparatus, said switch actuator comprising in combination:

a housing having a recessed surface with a plurality of spaced apertures therein;

a base actuator member having a plurality of hook members extending laterally therefrom and extending through said plurality of apertures in said housing recessed surface, said base actuator member further including a center portion having a pivotably attached end and a further free end with an operating tab extending laterally therefrom and movable in a direction substantially normal to the plane of said actuator;

an upstanding ridge positioned about the periphery of said housing recessed surface; and

a cover of flexible, non-metallic material having an inturned lip overfitting said base actuator member,

said actuator and overfitted cover providing a snap-type fit in said housing recessed surface with said hook members extending through and cooperating with said plurality of apertures, said upstanding ridge press fitting into the material of said lip of said flexible cover so as to provide an effective weather seal between said switch actuator and associated apparatus.

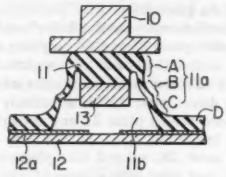
3,932,722

PUSH BUTTON BODY FOR A PUSH-BUTTON SWITCH PROVIDING SNAP-ACTION OF THE SWITCH

Akira Obata, and Takashi Saito, both of Koriyama, Japan, assignors to Nippo Communication Industrial Co., Ltd., Japan

Filed Apr. 16, 1974, Ser. No. 461,369
Int. Cl.² H01H *13/52*
U.S. Cl. 200—340 **5 Claims**

1. A push-button switch comprising a push-button body of a hollow mesa shape, being of a resilient material, and interposed between a key top and a printed pattern board, said push-button body having an inclined wall consisting of an upper portion, an intermediate portion and a lower portion, said inclined wall having a larger thickness at said upper portion and the thickness of the inclined wall being gradually reduced to a minimum thickness at the intermediate portion, the thickness of said inclined wall gradually increasing from said minimum thickness intermediate portion to a larger thickness lower portion, said upper portion, said intermediate portion and said lower portion being smoothly contiguous with one another.

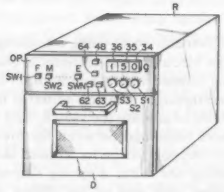


3,932,723

ELECTRONIC RANGE WITH AUTOMATIC ELECTRONIC DIGITAL TIMER

Motokazu Tamano, Yokohama; Tomimitsu Noda, and Masanobu Yoshioka, both of Fuji, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 17, 1974, Ser. No. 461,748
Claims priority, application Japan, Apr. 20, 1973, 48-44833
Int. Cl.² H05B *9/06*
U.S. Cl. 219—10.55 B **8 Claims**



1. An electronic range provided with a high frequency generator, which comprises a device including quantity-setting switches for setting a value representing the quantity of food being cooked; a device for indicating the set value in the form of digits; a pulse generator having a time constant circuit; a device including kind-setting switching means for varying the time constant of the time constant circuit to vary the period between pulses generated by said pulse generator in accordance with the kind of food; a counter for counting the number of pulses generated from said pulse generator upon the commencement of heating; and a control device for bringing the operation of the high frequency generator to an end when a prescribed relationship arises between the counts made by the counter and the set value set by said value setting device.

3,932,724

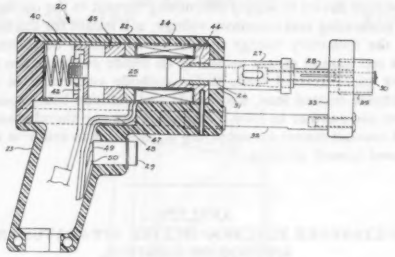
STUD WELDING APPARATUS

Robert J. Raycher, Brunswick, Ohio, assignor to Tru-Fit Products Corporation, Medina, Ohio

Filed June 3, 1974, Ser. No. 475,460
Int. Cl.² B23K *9/20*
U.S. Cl. 219—98 **22 Claims**

1. A capacitance discharge stud welding apparatus including in combination a housing, a coil in said housing, an armature movable between first and second positions relative to said coil, a stud chuck, means connecting said stud chuck to said armature, a welding shield secured to said housing and positioned so as to shield the welding of a stud to a metal member which stud is held by said chuck, a relatively light spring constantly urging said armature and said stud chuck

toward said first position in the direction of the metal member to which a stud held by said chuck is to be welded, engagement of a stud held by said chuck with a metal member causing said armature to move to said second position relative to said coil and against the urging of said light spring, an electri-



cal welding current circuit, electrical connection means connecting said welding current circuit to said chuck and to a stud held thereby, an electrical coil circuit electrically connected to said coil for energizing the same to move said armature to said first position.

3,932,725
METHOD FOR MONITORING AND REGULATING ELECTRICAL RESISTANCE WELDING

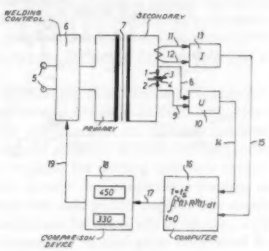
Franz-Josef Ganowski, Maingrundel, Germany, assignor to Keller & Knappich Augsburg Zweigniederlassung der Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Augsburg, Germany

Filed Feb. 28, 1974, Ser. No. 446,849

Claims priority, application Germany, Mar. 27, 1973, 2315184

Int. Cl.² B23K *11/24*

U.S. Cl. 219—110 **1 Claim**



1. A method for selectively monitoring and regulating electrical resistance welding processes by comparing actual, measured values with desired value limits, the latter being a measure of acceptable welding quality, comprising the steps of: conducting at least one test welding operation to establish the desired value limits, while the actual values are obtained during an actual welding operation; the desired value limits relating to the secondary welding current I, the resistance R between the welding electrodes, as well as the welding time t measured during a single actual welding operation; measuring the voltage across the electrodes, and the current applied thereto, during the actual welding operation; integrating the actual values of the voltage and the current to produce a welding result, by interpolation of both the actual and the desired values in the formula:

$$\int_0^t I \cdot R^y \cdot dt,$$

wherein

I is the secondary welding current in amperes,

R is the resistance between the electrodes in ohms,

Y is an exponent other than unity, and

t is the welding time in seconds;

the current, the resistance and the time being subject to unavoidable and tolerable fluctuations in predetermined ranges during the actual welding operation; selecting the magnitude of the exponent so that the influence of the resistance on the desired value limits is at least equivalent to the influence of at least one of the current and the welding time on the same value limits when the former fluctuate within the predetermined ranges; comparing the actual values with the desired value limits; and at least partly disconnecting electrode power when the actual values meet or exceed the desired value limits.

3,932,726
GLASS CUTTING

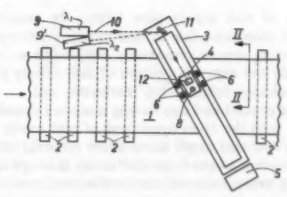
Willy Verheyen, Mol, Belgium; Andre Raes, Tiel, Netherlands; Jean-Paul Coopmans, Bierbeek, and Jean-Louis Lambert, Chaumont-Gistoux, both of Belgium, assignors to Glaverbel-Mecaniver S.A., Watermael-Boitsfort, Belgium

Filed Oct. 11, 1973, Ser. No. 405,598

Claims priority, application Luxemburg, Oct. 12, 1972, 66278

Int. Cl.² C03B *33/00*

U.S. Cl. 219—121 LM **5 Claims**



1. In a method of severing vitreous or vitrocrystalline sheet material along a predetermined line by inducing severing forces of thermal origin in the sheet material by irradiating it with at least one laser beam, the improvement comprising, before such irradiation of the material, scoring the material along substantially the entire length of said predetermined line, and subsequently effecting such irradiation by irradiating the material along such predetermined line with at least two laser beams of different radiation wavelengths such that the material to be severed has different degrees of transparency with respect to the different beams.

3,932,727
ELECTRICALLY HEATED RISER PIPE FOR A FLUID SUPPLY SYSTEM

Cecil Wayne True, 825 S. Maple St., Watertown, S. Dak. 57201

Filed Dec. 11, 1973, Ser. No. 423,712

Int. Cl.² H05B *3/02*; F16L *53/00*; F24H *1/12*

U.S. Cl. 219—301 **12 Claims**

1. A liquid supply supply system including in combination:

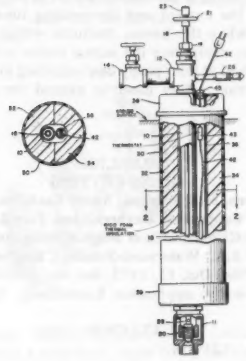
a rigid liquid supply pipe for supplying liquid from an underground supply source to an aboveground utilization point;

a rigid outer pipe with an inside diameter substantially greater than the outside diameter of said liquid supply pipe for encasing said liquid supply pipe with a space therebetween;

an above ground end cap and a below ground end cap on said outer pipe, each end cap having at least one opening for permitting passage of said supply pipe therethrough;

rigid foam thermal insulation means substantially filling the space between said supply pipe and said outer pipe;

an elongated straight cavity in said insulation means including therein a predetermined portion of the length of said supply pipe and having an open upper end, the cavity extending from the above ground end cap downwardly toward said below ground end cap, said predetermined



portion of said supply pipe having its outer periphery exposed along one side in said cavity, an elongated electric heating means removably positioned in said cavity alongside the exposed portion of said supply pipe and in heat exchange relationship therewith; and

said above ground end cap having a second opening therein aligned with the open upper end of said cavity and being of such size and shape as to allow removal of said elongated heating means from said cavity through said second opening irrespective of connections made to said supply pipe.

3,932,728

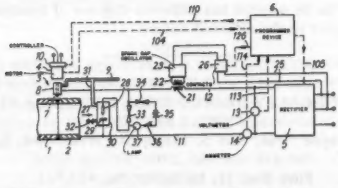
ELECTRIC ARC FUSION WELDING APPARATUS

Ian Stuart Maxwell, Kitimat, Canada, assignor to Babcock & Wilcox, Limited, London, England

Filed Sept. 5, 1974, Ser. No. 503,404

Int. Cl.² B23K 9/10

U.S. Cl. 219—131 R **8 Claims**



1. A fusion arc welding apparatus for making welds on a work piece and comprising a welding head, a non-consumable electrode mounted in said head, a motor for moving said electrode along a path traversing the work piece, a device programmed for a predetermined sequence of welding operations, a controller responsive to the programmed device to regulate the operation of said motor, a direct current arc supply circuit including a rectifier and separate leads connecting the rectifier to said electrode and work piece for maintaining a working arc potential across a gap between said electrode and work piece, a circuit communicating with said electrode related lead for applying a transitory voltage therethrough to initiate the arc, said last named circuit including an alternating current supply means, a spark gap oscillator, and contact means interposed between said oscillator and supply means, said contact means being triggerable by the programmed device to supply alternating current to the oscillator for generating said transitory voltage, and means for discharging the transitory voltage should the arc fail to be initiated, said last named means including an anode connected to the work piece related lead, and a cathode connected to the electrode related lead, said anode and cathode being spaced from one another to form a secondary arc gap therebetween, and conduit means for supplying an inert gas to said first and second named arc gaps.

3,932,729

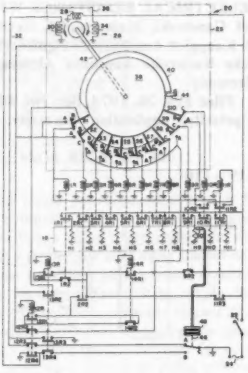
MULTI-STAGE ELECTRIC HEATER APPARATUS AND METHOD OF CONTROL

Andrew J. Schlangen, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Oct. 23, 1974, Ser. No. 517,075

Int. Cl.² H05B 1/02

U.S. Cl. 219—486 **12 Claims**



1. A method of controlling a plurality of electric heaters for heating a space including one large heater and a plurality of smaller heaters, each of said large and small heaters having a separate actuator means for actuating its respective heater toward an energized condition comprising the steps upon a continuous heating demand as sensed by a thermostat responsive to the temperature of said space of:

A. sequentially actuating said actuator means of said smaller heaters toward their heater energizing conditions;

B. subsequently deactuating said actuator means of said smaller heaters toward their heater de-energizing condition and actuating said actuator means for said larger heater toward its heater energizing condition; and

C. subsequently sequentially reactuating said deactuated actuator means until all of said actuator means for said large and smaller heaters are actuated toward their heater energizing condition.

3,932,730

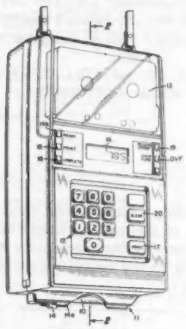
POINT-OF-ACTION BILLING TRANSACTOR

Biagio F. Ambrosio, Woodland Hills, Calif., assignor to Electronic Memories & Magnetics Corporation, Los Angeles, Calif.

Continuation of Ser. No. 356,503, May 2, 1973, abandoned. This application Sept. 30, 1974, Ser. No. 510,560

Int. Cl.[2] G06K *1/00*

U.S. Cl. 235—61.9 R 5 Claims



1. In a portable billing transactor for entering and processing a utility service transaction, and printing a bill on a record medium for immediate delivery to a customer, said service being measured by a meter read by a person for manual entry, said medium having information necessary for computing the bill in predetermined areas, said information including the previous meter reading and a rate code, the combination comprising:

means for accepting said record medium and holding it in a static postion during a billing transaction;

calculating means for performing arithmetic calculations on data coupled thereto under electronic control, said calculating means including first and second arithmetic registers;

means for reading data from different predetermined areas of said record medium at different controlled times;

means for printing data on different predetermined areas of said record medium at different controlled times;

a buffer register for storing said new meter reading;

keyboard means for manually entering said new meter reading into said buffer register for display;

keyboard means for manually producing a print command;

means responsive to said print command for coupling said net meter reading as displayed from said buffer register into said calculating means;

a source of clock pulses;

a ready light and means for displaying said new meter reading entered into said buffer register;

sequence control means including a program counter responsive to said source of clock pulses for automatically controlling said calculating means, reading means and printing means through predetermined coordinated operations once said accepting means has received a record medium in said static position, said coordinated operations comprising:

energizing said ready light to call for manual keyboard entry of said new meter reading into said buffer register after said holding means has accepted said record medium and said record medium is being held in a static position;

energizing said display means to call for a manual keyboard production of said print command to cause said new meter reading to be printed on said record medium and to be coupled into said first one of said arithmetic registers;

reading said previous meter reading from a second predetermined area of said record medium into said second one of said arithmetic registers when printing of said new meter reading has been completed;

computing a difference between said new meter reading and said previous meter reading, and for storing the difference in said first one of said arithmetic registers;

printing said difference in a preselected area of said record medium;

reading said rate code into said calculating means;

computing the amount due from said difference and said rate code;

printing said amount due in a preselected area of said record medium.

3,932,731

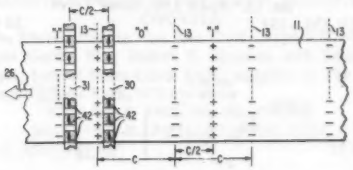
CODE CONVERTER

Glenn Ellis Moore, Jr., Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 494,031, Aug. 2, 1974. This application Feb. 27, 1975, Ser. No. 553,528

Int. Cl.[2] G06K *7/08*, *5/00*; G11B *5/30*

U.S. Cl. 235—61.11 D 14 Claims



1. A sensor for the detection of the presence of characteristic properties of a bit representation in a sequence of bit representations being moved along an axis, each of said representations having a characteristic cell length, said sensor comprising first and second elements operative independently and responsive to each of said bits coupled thereto to provide a signal indicative thereof, said first and second elements being spaced apart along said axis a distance equal to half said cell length.

3,932,732

KEYED CONTROL DEVICE FOR MACHINES AND OTHER INSTRUMENTALITIES

Wayne D. McAllister, 695 Bush Garden Drive, Pasadena, Calif. 91105, and Louis S. Polster, 28034 Cero Drive, Saugus, Calif. 91335

Continuation of Ser. No. 75,166, Sept. 24, 1970, abandoned. This application Aug. 14, 1972, Ser. No. 280,504

Int. Cl.[2] G06M *3/02*

U.S. Cl. 235—92 CT 5 Claims

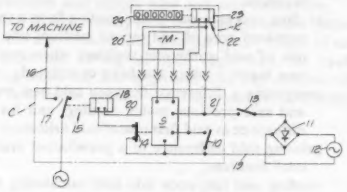
1. A control device for preventing the unauthorized use of an instrumentality in the performance of an operation, which comprises:

a. a main control unit, and a portable manually electrically connectable and disconnectable auxiliary keying unit for normally activating and deactivating first means for establishing and interrupting an operation control circuit to said instrumentality; and

b. control means having components for sensing and measuring an operating characteristic of said instrumentality;

c. said measuring component being incorporated within said keying unit and being electrically activated, means to

pre-set the measuring component to a predetermined measurement, said measuring component upon attaining said pre-set measurement being operable to energize said



first means so as to interrupt the established control circuit to said instrumentality, and said measuring component comprising an electrochemically activated device.

3,932,733

AUTOMATIC FOCUSING OF AN OPTICAL SYSTEM

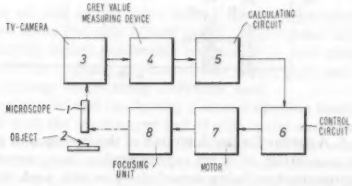
Bengt Olsen, Flottiljgatan 4, 753 37 Uppsala; Jens Blomster, Vapnargatan 15 A, 753 36 Uppsala; Nils Buss, Vaktargatan 2 B, 754 22 Uppsala; Bjorn Stenkvist, Dobelnsgaten 13, 752 37 Uppsala, all of Sweden, and Lucien Preuss, Feldeggstrasse 74, 8008 Zurich, Switzerland

Filed Mar. 19, 1973, Ser. No. 342,426

Claims priority, application Sweden, Mar. 17, 1972, 3481/72

Int. Cl.[2] H04N *5/38*; G06F *15/46*

U.S. Cl. 235—151 **24 Claims**



1. A method of automatically focussing an optical system onto an object, comprising:

deriving a measure of the contrast for each of a plurality of images obtained at different settings of the optical system; and

determining the final focussed setting of the optical system as that setting which corresponds to the image of greatest contrast;

wherein the improvement comprises:

deriving the measure of contrast from the distribution of selected elements of the image within a grey scale.

3,932,734

BINARY PARALLEL ADDER EMPLOYING HIGH SPEED GATING CIRCUITRY

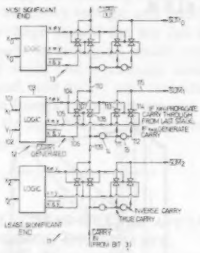
Brian Jeremy Parsons, Stevenage, England, assignor to Hawker Siddeley Dynamics Limited, England

Filed Mar. 8, 1974, Ser. No. 449,461

Int. Cl.[2] G06F *7/50*

U.S. Cl. 235—175 **3 Claims**

1. Multi-stage circuitry for use in a binary digital system, comprising a succession of stages each including first and second C-MOS transmission gates, each said gate comprising a p-channel MOS transistor having source, drain and gate electrodes and an n-channel MOS transistor having source, drain and gate electrodes, with the source electrodes of said two transistors connected in common and the drain electrodes of said two transistors connected in common, each stage except the first further including an input line from a preceding stage connected to said source electrodes of said first transmission gate, each stage except the last further including an output line to the next succeeding stage connected to said drain electrodes of both said transmission gates, each said



stage further including a stage control input connected to said source electrodes of said second transmission gate and two stage input lines carrying complementary binary signals connected respectively to the opposite gate electrodes of both transmission gates.

3,932,735

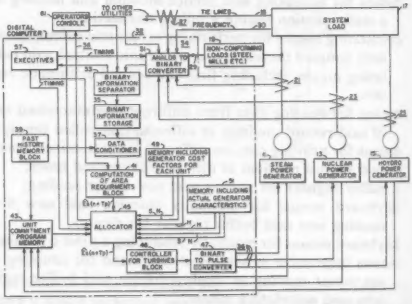
METHOD OF CONTROLLING SUPPLY OF POWER

Theodore C. Giras, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 66,591, Aug. 24, 1970, abandoned, which is a continuation of Ser. No. 722,805, April 19, 1968, abandoned, which is a continuation of Ser. No. 425,588, Jan. 14, 1965, abandoned. This application Feb. 3, 1972, Ser. No. 223,378

Int. Cl. G06f *15/06, 15/56*; H02j *3/06*

U.S. Cl. 235—151.21 **67 Claims**



1. The method of, operating a power complex to supply a system load and non-conforming loads; said power complex having a power generating network including a plurality of power generators and tie-lines to neighboring power generating networks, the said method comprising deriving from said complex at relatively short intervals, of the order of one second, signals indicative of:

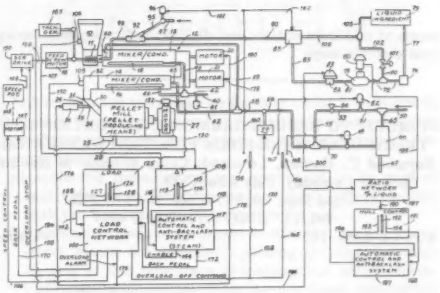
1. the load power supplied by each of said generators,
2. the frequency of the power of said load,
3. the power drawn by said tie-lines,
4. the power drawn by said non-conforming loads; the said method also comprising converting said signals into digital values, separating said digital values into separate items of data each item corresponding to said items 1, 2, 3 and 4 respectively; storing said separate items; comput-

ing from a plurality of said items derived during a plurality of said intervals and the past history of operation of said complex, an area-requirement error which is based, for each computator on the anticipated trend of variation of said system load following the latest of said intervals, responsive to said area-requirement error producing electrical generator resetting signals to reset economically each power generator of said plurality of generators to the extent required to reduce said error to zero, and supplying said resetting signals to said generators to reset said generators as aforesaid.

3,932,736
AUTOMATIC PELLET PRODUCING SYSTEM

Albert I. Zarow, Mount Pulaski, Ill., and Joseph A. Volk, Jr., Florissant, Mo., assignors to Beta Corporation of St. Louis, Bridgeton, Mo.

Filed Apr. 8, 1974, Ser. No. 458,481
Int. Cl.² G05B *13/00*; A23N *17/00*
U.S. Cl. 235—151.1 **55 Claims**



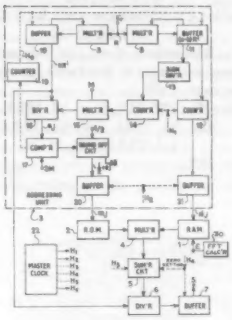
1. An automatic control system for a pelleting apparatus, the apparatus including a pellet producing means and means for feeding a supply of milled material to the producing means, said control system comprising means for automatically controlling the moisture content of the material at the producing means to within a prescribed range, and means responsive to said moisture content controlling means for automatically controlling the feed rate of the material to the producing means.

3,932,737
SPECTRUM ANALYZER ESTABLISHING A NONLINEAR FREQUENCY DISTRIBUTION OF POWER-DENSITY SPECTRA

Pierre Delépine, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 5, 1973, Ser. No. 412,786
Claims priority, application France, Nov. 7, 1972, 72.39348
Int. Cl.² G06F *15/34*
U.S. Cl. 235—152 **9 Claims**

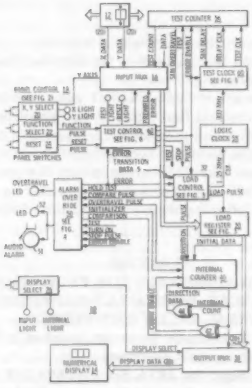
1. A spectrum analyzer for electrical signals, comprising:
a source of precalculated spectral samples equispaced over a predetermined frequency range;
conversion means connected to said source for transforming said precalculated samples into modified samples nonuniformly distributed over said frequency range, said conversion means including a store of weighting coefficients divided into groups which define a plurality of spectral windows along said frequency range, said windows differing in width from one another, said conversion means further including calculating means connected to said source and to said store; and
addressing means connected to said store for ascertaining the presence of any precalculated sample in the frequency band of each window and determining the respective weighting coefficient closest to each precalculated sample in any window;
said calculating means being connected to said addressing means for modifying each precalculated sample in accordance with the magnitude of the respective closest weighting coefficient.



3,932,738
TRANSITION MONITOR FOR A UNIT TRANSITION COUNTER

Charles Elwood Hauber, San Jose, Calif.; Stephen L. Vizvary, Punta Gorda, Fla.; Robert E. Simpson, and Jerome W. Meyer, both of Santa Clara, Calif., assignors to The Singer Company, New York, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,682
Int. Cl.² G05B *23/02*, *1/03*; H03K *13/32*
U.S. Cl. 235—153 AP **15 Claims**



1. A device for monitoring numerically sequential input data having unit transitions, comprising:
input means for receiving the input data;
at least one internal counter responsive to the input means for changing the internal count data by one unit transition for each transition of the input data;
comparator for comparing the input data to the internal count data for establishing an ERROR state within the device when the input data is not identical to the internal count data;
output means for outputting data from the device; and
a test means for providing test data to the input means, the test means comprising an error circuit for statistically

testing the device by providing multistep error data to the input means.

3,932,739

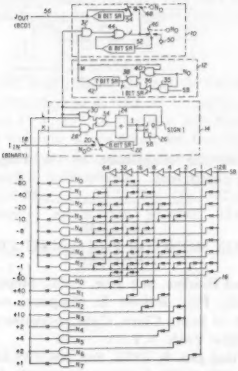
SERIAL BINARY NUMBER AND BCD CONVERSION APPARATUS

Bruce C. Lutz, Richardson, Tex., and Delaine C. Sather, Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 395,817, Sept. 10, 1973. This application Nov. 14, 1974, Ser. No. 525,422

Int. Cl.² H03K *13/24*

U.S. Cl. 235—155 **6 Claims**



3. Apparatus as claimed in claim 2 wherein:

said third means includes a J–K flip-flop for providing the sign detection;

said gating means includes NAND gates which pass the constants from said first series if the sign of the previous word is positive and pass the second series of constants if the sign of the previous word is negative; and

said fifth means includes storage means for providing the converted BCD number word output during the entire time frame following the conversion time frame.

3,932,740

METHOD AND APPARATUS FOR PROCESSING TWO D.C. VOLTAGES, ESPECIALLY REPRESENTING UNBALANCE COMPONENTS

Martin Mueller, Bickenbach, Germany, assignor to Firma Carl Schenck AG, Darmstadt, Germany

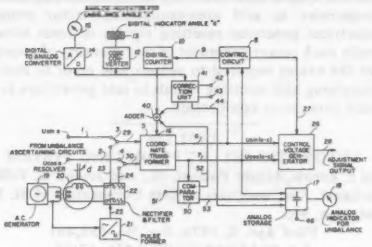
Filed Sept. 16, 1974, Ser. No. 506,210

Claims priority, application Germany, Sept. 27, 1973, 2348498

Int. Cl.² G06G *7/22*

U.S. Cl. 235—186 **20 Claims**

1. A method of processing first and second d.c. voltages, each of which represents information having angular amplitude components; comprising applying said voltages to separate inputs of a coordinate transformation means, adjusting a closed loop control means connected to a control input of said coordinate transformation means in discrete steps in response to the output voltage of said transformation means, until the output voltage of said coordinate transformation means corresponding to one of said d.c. voltages becomes equal to **0**, whereby the other output voltage of said coordinate transformation means represents said amplitude component and the output of said control means represents said angular components of said information, and digitally indicating and storing said discrete steps.



3,932,741

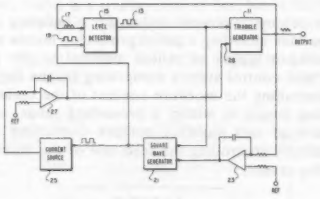
CIRCUIT TO REDUCE HARMONIC DISTORTION IN A TRIANGULAR WAVE-FORM FUNCTION GENERATOR

Raymond C. Hanson, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sept. 30, 1974, Ser. No. 510,273

Int. Cl.² G06G *7/26*; **H03K** *4/08*

U.S. Cl. 235—197 **3 Claims**



1. A device for generating triangular wave forms comprising:

first means for generating a triangular wave form in response to an input signal;

level detecting means interconnected in loop configuration with said first means for providing a first square wave signal to said first means in response to said triangular wave form applied at a first input and a level detector reference signal applied at a second input of said level detecting means;

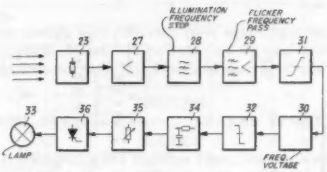
integrator means interconnected with said first means for integrating said triangular wave form to produce an average value thereof indicative of the amplitude symmetry of said triangular wave form and comparing said average value with a reference level to produce an amplitude symmetry error signal; and

square wave generating means interconnected between said integrator means and said level detecting means for producing a second square wave signal of the same frequency as said first square wave signal and having an amplitude responsive to said amplitude symmetry error signal from said integrator means, said second square wave signal serving as said level detector reference signal.

3,932,742
LOAD-CONTROL SYSTEM RESPONSIVE TO OPERATING CONDITION OF PRODUCER OF INTERMITTENT RADIATION

Otto Freudenschuss, Vienna; Herbert Krammer, Hinterbruhl, and Robert Scheiber, Vienna, all of Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Mar. 7, 1973, Ser. No. 339,024
Claims priority, application Austria, Mar. 9, 1972, 1955/72
Int. Cl.² H04B 9/00
U.S. Cl. 250—199 **13 Claims**



1. A monitoring system for controlling a load in response to changes in the operating condition of an apparatus producing intermittent radiation interrupted at a predetermined frequency, comprising:

photoelectric transducer means positioned in the path of said light waves for generating a signal voltage varying with the frequency of interruption thereof;

frequency-discriminating means connected to said transducer means for selectively passing the signal voltage varying at said frequency of interruption, said frequencydiscriminating means comprising a band pass circuit including a negative-feedback loop, said negative-feedback loop comprising a band-stop filter having a stop band including said frequency of interruption whereby said band-pass circuit passes said frequency of interruption said band-stop filter having a stop band in a range different from that of said pass band for eliminating extraneous frequencies other than said frequency of interruption; and

load-control means including a switching circuit connected to said frequency-discriminating means for actuation by said signal voltage in the absence of said intermittent radiation.

3,932,743
PHOTO-COPYING DEVICE

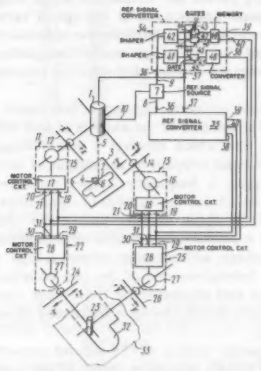
Valentin Mikhailovich Sitnichenko, ulitsa Odesskaya 58/6, kv. 14; Alexandr Mikhailovich Zamuruev, ulitsa Tereshkovoi 12, kv. 24, and Andrei Isakovich Kogut, ulitsa Pionerskaya 20, kv. 12, all of Odessa, U.S.S.R.

Continuation-in-part of Ser. No. 866,334, Oct. 14, 1969, abandoned. This application Oct. 31, 1973, Ser. No. 411,412
Int. Cl.² G06K 11/02
U.S. Cl. 250—202 **1 Claim**

1. A photo-copying device for regulating the displacement of the working member of a metal gas-cutting machine according to a contour being copied, said device comprising: a photoelectric transducer for the circular scanning of the line of the contour being copied by means of an optical scanning beam for the detection of points of intersection of said beam with said contour line; the path of said beam at the contour being a circumference of a circle a center lying at least approximately on the contour line being copied; said optical scanning beam moving along said path at a constant angular speed and intersecting said contour line at two points; the output signal of said photoelectric transducer during one scanning period being a short pulse generated when the contour line being copied is intersected at one of said points;

mutually perpendicular guides for guiding displacement of said transducer;

a reference signal source having two outputs at which are produced two reference signals in the form of sine and cosine voltages synchronized with said angular speed of movement of said scanning beam along said circumference, the initial phase of said sine voltage corresponding to the position of said scanning beam at the intercept of said scanning orbit with a positive X half-axis in a Cartesian coordinate system wherein the origin coincides with said center of said circumference, and whereof the X and Y axes run parallel to the mutually perpendicular guides for displacement of said photoelectric transducer along said line being copied; the initial phase of said cosine voltage corresponding to the position of said scanning



beam on the positive Y half axis of said Cartesian coordinate system;

said reference signals defining the coordinate components of the speed vector in displacement of said photoelectric transducer along said line being copied, the speed vector being directed from said center of the circumference toward the intercept of said beam with said line being copied;

a first drive adapted to move said photoelectric transducer in said guides along the X axis;

a second drive adapted to move said photoelectric transducer in said guides along the Y axis;

machine guides for said working member;

a third drive for shifting said working member along the machine guides corresponding to the X axis;

a fourth drive for shifting said working member along the machine guides corresponding to the Y axis, and running perpendicular to said guides corresponding to the X axis;

said third and fourth drives moving said working member along said guides of the machine with a predetermined proportionality factor with respect to similar displacement of said photoelectric transducer along said X and Y axes for obtaining a scale between the contour of a blank being cut out of a metal sheet by said working member and the contour being copied;

a first converter for converting the instantaneous values of said cosine voltage of the reference signal, corresponding to the intercepts of said scanning optical beam with said line being copied, into a number of pulses delivered during each period of said circular scanning which determine the number of equal steps through which said first drive moves during each circular scanning period and define the scalar magnitude of said coordinate component in the speed vector of the displacement of said photoelectric transducer along the X axis, and also into a logic symbol defining the direction of displacement of said photoelectric transducer along said X axis, said first converter

having a first input which is connected to one of the outputs of said reference signal source and which receives a cosine voltage therefrom, a second input coupled to the output of said photoelectric transducer, a frequency output giving out said pulses whose number during the circular scanning period is proportional to said instantaneous value of said cosine voltage, and two sign outputs a logic unity at one of which determines one of the two directions of displacement of the photoelectric transducer along the X asis;

a second converter for converting the instantaneous values of said sine voltage generated at time moments when said scanning optical beam intersects said line being copied, into a number of pulses following during each period of said circular scanning which determine the number of equal steps made by the second drive during each circular scanning period and define the scalar magnitude of said coordinate component in the speed vector of the displacement of said photoelectric transducer along the Y axis, and also into a logic symbol designating the direction of movement of said photoelectric transducer along the Y axis;

said second converter having a first input which is connected to another of the outputs of said reference voltage source and which receives a sine voltage therefrom, a second input coupled to the output of said photoelectric transducer, a frequency output producing said pulses which determine the number of equal steps of said second drive and whose number during the circular scanning period is proportional to said instantaneous value of said sine voltage, and two sign outputs a logic unity at one of which determines one of the two directions of displacement of said photoelectric transducer along the Y axis;

each of said drives having a frequency input and two sign inputs;

said frequency output of the second converter being connected to said frequency inputs of the second and fourth drives;

said sign outputs of the second converter being connected to said sign inputs of the second and fourth drives; each of said converters comprising:

a first shaper of unidirectional pulses in the form of rectified half-waves of said reference signal, having an input and an output;

a second shaper of square pulses corresponding to the polarity of the half-wave voltages of said reference signal, having two inverted outputs;

the inputs of said first and second shapers being interconnected to form said first converter input;

a first gating circuit which has a signal input connected to said output of the first shaper, a gating input and an output; short pulses appearing at said output of the first gating circuit corresponding to the scalar magnitudes of said instantaneous values of the reference signal;

a second gating curcuit having a signal input connected to one of said inverted outputs of the second shaper, a gating input and an output;

a third gating circuit provided with a signal input coupled to the other said inverted output of the second shaper, a gating input and an output;

said gating inputs of the first, second and third gating circuits being interconnected to form said second input of the converter;

short pulses produced across any output of said second or third gating circuit defining the sign of said instantaneous values of the reference signal;

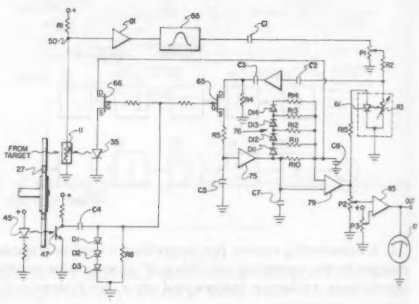
a converter unit for converting the amplitudes of said output short pulses from said first gating circuit into a proportional number of pulses following at a frequency higher than the frequency of the reference signal; said unit having an input connected to said output of the first gating circuit and an output forming said frequency output of the converter; a memory store which has a unity input and a zero input; said zero input being connected to said output of the second gating circuit, said unity input being connected to said output of the third gating circuit, said zero and unity outputs forming said sign outputs of the converter.

3,932,744

NULL BALANCE RADIOMETRIC APPARATUS

Alan S. Anderson, Littleton, Mass., assignor to Williamson Corporation, Concord, Mass.

Filed Dec. 6, 1974, Ser. No. 530,079
Int. Cl.² G01J 1/20
U.S. Cl. 250—203 **10 Claims**



7. Radiometric apparatus comprising:

a detector element providing a signal which varies as a function of incident radiant energy;

an optical system for coupling radiation between a target and said detector element;

a rotatable chopping disk interposed in the optical path between said target and said detector element;

means for generating a timing signal which is synchronously related to the rotation of said chopping disk;

a light-emitting diode for selectively providing radiation which is also incident on said detector following an optical path which does not traverse said chopping disk;

synchronous detector means controlled by said timing signal for demodulating any a.c. component of the signal provided by said detector element which is synchronous with said chopping thereby to obtain a feedback signal which varies as a function of the relative levels of radiation incident on said detector element during the alternate phases of chopping; and

means for applying said feedback signal to said light-emitting diode through a gating means which is controlled by said timing signal thereby to balance the incident radiation levels during the alternate phases of chopping, the average level of energization of said light-emitting diode being indicative of the level of radiation received from said target.

3,932,745

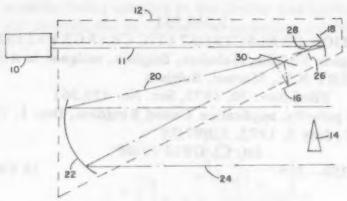
FAR FIELD CONSTRUCTION FOR OPTICAL FOURIER TRANSFORMS

Richard L. Hartman, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 30, 1974, Ser. No. 510,519
Int. Cl.² G01C 25/00
U.S. Cl. 250—216 **10 Claims**

1. An optical reflective device comprising a laser source, a first optical device mounted to receive a laser beam from said laser source and transmit said laser beam in a back focal plane, a second optical device mounted for receiving said laser beam in said back focal plane in the front focal plane of said second optical device and transmitting said beam in a back focal plane, a target mounted in said back focal plane of said second optical device for receiving said laser beam from said second optical device, a detector mounted in an off-set front

focal plane of said second optical device, and a beam splitter mounted relative to said first and second optical devices so



that laser energy light reflected from said target back to said second optical device will be reflected by said beam splitter onto said detector in forms of far field pattern of said target.

3,932,746

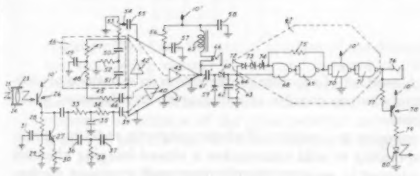
TIMING SYSTEM HAVING INFARED START-STOP GATES

Robert E. Swanson, 4725 Highline Place, Denver, Colo. 80216

Filed Apr. 5, 1974, Ser. No. 458,117

Int. Cl.² G01D *21/04*

U.S. Cl. 250—221 **18 Claims**



1. A readily portable timing system for sporting events and the like comprising:

means for generating pulsed invisible light,

means for directing light from said generating means in a beam across a predetermined path,

light beam receiving means,

said receiving means including means for utilizing the impingement thereon of light from said generating means for producing a sensory signal to facilitate optimum alignment of said receiving means with said beam along said path,

means associated with said receiving means for detecting an interruption of said beam,

timing means having a start and stop control, and

means dependent upon interruption of said beam for actuating said start and stop control to change the condition of operation of said timing means.

3,932,747

NONFLUID-FILLED BOREHOLE LOGGING APPARATUS

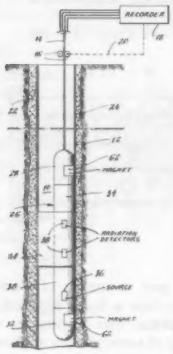
Harold Sherman, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed May 23, 1974, Ser. No. 472,916

Int. Cl.² G01V *5/00*

U.S. Cl. 250—256 **24 Claims**

1. An elongated sleeve for use with a sonde in logging a subsurface earth formation transversed by nonfluid-filled borehole to determine a selected formation parameter, which sonde has a portion adapted to house a source for emitting radiation into the earth formation and a portion adapted to house at least one radiation detector spaced from the source for use in determining a selected formation parameter comprising a covering member formed to cover a detector portion of a sonde and fabricated of a material selected to provide a particular borehole environment, the member being adapted for attachment to the sonde to prevent substantial longitudinal and rotational movement therebetween and having, in transverse cross-section, (1) an outer surface that conforms generally to a portion of a borehole and (2) an inner surface that conforms generally to the portion of a sonde.



3,932,748

METHOD OF DETERMINING THE DISTANCE BETWEEN AREA UNDER FIRE AND THE MUZZLE OF THE WEAPON

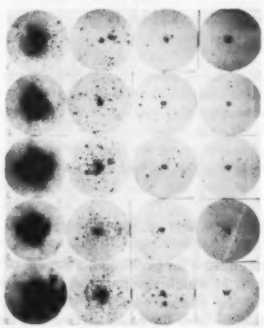
Jürgen Schmitz, Leopoldshafen, Germany, assignor to Gesellschaft für Kernforschung m.b.H., Karlsruhe, Germany

Filed Mar. 25, 1974, Ser. No. 454,556

Claims priority, application Germany, Mar. 24, 1973, 2314755

Int. Cl.² G21H *5/02*

U.S. Cl. 250—303 **5 Claims**



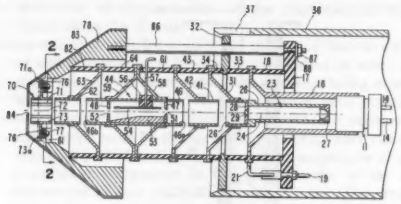
1. A method of determining the distance between an area under fire and the muzzle of the weapon by means of autoradiography of the irradiated firing residues on this area, comprising (a) firing at several carrier areas from various distances, (b) subsequently activating the carrier areas by neutron irradiation, (c) subsequently contacting the carrier areas with a film sensitive to nuclear radiation, (d) developing the film, (e) preparing an autoradiograph of a firing trace to be investigated by following steps (b) through (d), (f) comparing the series of autoradiographs produced after development on the film with the autoradiograph produced of the firing trace to be investigated.

3,932,749

ELECTRON GUN

Norman J. Taylor, Los Altos, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Mar. 22, 1974, Ser. No. 454,038
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—306 8 Claims



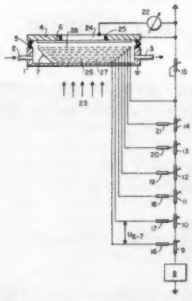
1. In an electron gun: a source of electrons, means for forming the electrons into a beam directed along an axis, a three element cylindrical lens having an output electrode comprising a plurality of semicylindrical plates disposed coaxially of the beam at a predetermined location along the axis, means for applying a deflection potential to the plates to deflect the beam from the axis, and means for applying a correction potential to the plates to correct astigmatism in the beam.

3,932,750

RAY CONVERTER

Karl-Hans Reiss, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 2, 1974, Ser. No. 430,043
Int. Cl.[2] H01J *31/50*
U.S. Cl. 250—315 A 5 Claims



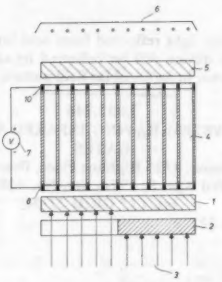
1. A converter device for producing a stream of electrically-charged particles in which the particle distribution over the cross-section of the stream varies in dependence upon the intensity distribution over the cross-section of a beam of penetrating radiation directed on to the device, the device comprising an anode, a cathode, an ionization chamber having a plurality of gridform electrodes arranged one after another along a path from the anode to the cathode, said grid-form electrodes being substantially parallel to the anode and the cathode, and means connected with the grid-form electrodes for applying thereto working voltages, which increase in the direction from the cathode to the anode, whereby when the device is in use with gas in the chamber under given working conditions there is produced between two of the gridform electrodes which are adjacent to the cathode an electric field having a strength between 1% and 10% below the minimum strength of a homogeneous electric field that would be required to bring about electrical break-down in said gas under the given working conditions.

3,932,751

FORMATION OF ELECTROSTATIC CHARGE PATTERNS

Karel Eugeen Verhille, Hoboken, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Nov. 30, 1973, Ser. No. 420,561
Claims priority, application United Kingdom, Dec. 1, 1972, 55693/72; July 5, 1973, 32007/73
Int. Cl. G01d *15/06*
U.S. Cl. 250—315 16 Claims



1. A method of recording information as a pattern of electrostatic charges capable of xerographic development which comprises:

a. exposing to a pattern of electromagnetic radiation corresponding to said information a closed imaging chamber adapted to produce therein upon such exposure electrostatic charges of a given polarity in a pattern corresponding to such exposure, said chamber having a wall section thereof coextensive in area with the charge pattern formed therein constituted of dielectric material,

b. electrically biasing said pattern of charges against the inner surface of said dielectric wall section, and

c. concurrently with said radiation exposure, generating from a source exteriorly of said chamber a corona discharge opposite in polarity to the charges in said pattern and directing such discharge uniformly toward the exterior side of said dielectric wall section to produce adjacent said exterior side an array of corona generated charges modulated in density in a pattern according to the pattern of charges of opposite polarity present on the interior surface of said dielectric wall section.

3,932,752

GAMMA COUNTER SHUTTER ASSEMBLY

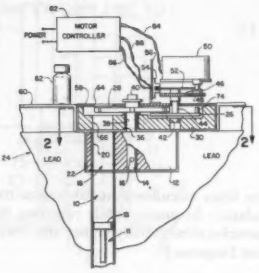
Roy W. Aday, Jr., La Habra, and Duane G. Barber, Yorba Linda, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 19, 1974, Ser. No. 443,782
Int. Cl. G01t *1/20*
U.S. Cl. 250—328 8 Claims

1. A radioactivity measuring system having a sample counting chamber and means for inserting a sample into and removing the sample from the counting chamber through an entrance thereof comprising:

a high inertia-shutter impervious to radioactive emissions and mounted over the entrance to the sample counting chamber and rotatable between first and second shutter positions which, respectively, open and close the sample chamber entrance, the shutter having a sample access port extending therethrough which, in the first shutter position, is aligned with the sample chamber entrance to permit insertion and removal of the sample into and out of the sample chamber; and

drive means for rotating the shutter between the first and second shutter positions including cooperating driven and drive members rotatable about parallel axes, the driven member being coupled to the shutter and having a radial slot therein, the drive member including a drive element

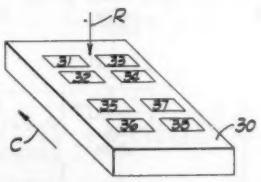


radially offset from the axis of rotation of the drive member and sliding radially inward and outward of the slot with rotation of the drive member to accelerate and then decelerate the driven member and hence t shutter in response to rotation of the drive member and to loc the shutter in place when the drive member is stopped.

3,932,753
PYROELECTRIC DEVICE WITH COPLANAR ELECTRODES

Suzanne C. Stotlar, Garretsville, Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 406,812, Oct. 16, 1973, abandoned. This application Dec. 30, 1974, Ser. No. 537,241
Int. Cl.² G01J *1/00*
U.S. Cl. 250—332 **6 Claims**

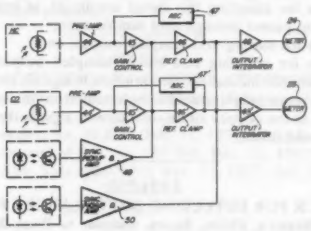


1. A single surface pyroelectric detector comprising in combination a substantially single domain body of ferroelectric material provided with a pair of electrodes to convey therebetween a pyroelectric response of said material, said electrodes being proximately disposed in a spaced-apart relationship on a generally planar single surface of said material which has been poled by a polarizing voltage between said electrodes, said response conveyed between said pair of electrodes being essentially independent of other responses conveyed between other electrodes on said material.

3,932,754
GAS ANALYZER

Max J. Riedl, and Thaddeus C. Ross, both of Santa Barbara, Calif., assignors to Infrared Industries, Inc., Santa Barbara, Calif.

Continuation of Ser. No. 325,729, Jan. 22, 1973, abandoned. This application Mar. 27, 1974, Ser. No. 455,345
Int. Cl.² G01N *21/26*
U.S. Cl. 250—343 **9 Claims**



1. A gas analyzer of the infrared absorption character comprising, in combination,

a frame,

a sample tube,

a reference tube,

said sample and reference tubes both being supported by the frame,

an infrared source positioned at one end of the tubes,

a detector means comprising a plurality of detectors and a filter over each of said detectors appropriate to a component to be analyzed positioned at a spot remote from the infrared source,

a transmitting mirror remote from the infrared source and said tubes proportioned optically to receive, to split, and to image the split parts of the infrared beam back through each the sample tube and the reference tube in substantially equal intensity,

a receiving mirror remotely opposed to said transmitting mirror and opposite the detector means optically proportioned to direct the respective imaged split parts of the infrared beam from said tubes toward the respective ones of said plurality of detectors,

the path lengths of said infrared beam from said infrared source to said sample tube and to said reference tube and from said sample tube and said reference tube to said detector means being identical and the length of said sample and reference tubes being identical, and wherein all elements of the optical system are identical, whereby the optical system of said gas analyzer is completely balanced,

chopper means interposed in said pathway between the infrared source and detector means to alternatively direct the path of the imaged parts of the infrared beam through the sample tube and reference tube so apertured that energy never passes through both tubes simultaneously but rather passes through each tube for less than one half the time for one rotation of the chopper means thereby alternately gating energy through the reference tube and the sample tube with a time gap therebetween,

and readout means in circuit relationship to each of said detectors to compare the signal attenuation through the sample chamber with the reference chamber and calibrate the same to read the concentration of gas specific to the wave length of the detector's associated filter proportional to the signal differential between the reference tube and the sample tube, thereby enabling the gas analyzer to read out two or more components simultaneously without time sharing, said readout means in circuit relationship to each of said detectors comprising,

amplifier means for amplfying the output signal from said detector,

gain control means directly coupled to said amplifier means,

a reference clamp for clamping to ground the output signal during the time the infrared beam passes through the reference tube,

an automatic gain control amplifier for providing a peak-to-peak signal of a pre-established value, the clamped and amplitude stabilized signal from said gain control means and said reference clamp being coupled to said automatic gain control amplifier,

means for sampling the signal amplitude as said infrared beam passes through said sample tube,

means for storing said sampled output, and

means for coupling said stored sampled output to meter means for indicating the variation in signals between said reference tube and said sample tube from the same detector as the copper alternately directs signals through each of said tubes.

3,932,755

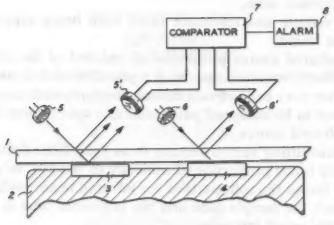
DEVICE FOR DETECTING DOUBLE SHEET FEEDING

Takizo Sagawa, Ebina, Japan, assignor to Rank Xerox Ltd., London, England

Filed Aug. 9, 1974, Ser. No. 495,969

Int. Cl.² G01J *1/00*

U.S. Cl. 250—349 **4 Claims**



1. An apparatus for detecting the feeding of piled sheets along a sheet feed path comprising:

a first reflection plate positioned in said sheet feed path, said first plate having a high reflectivity;

a second reflection plate positioned in said sheet feed path, said second plate having a low reflectivity as compared to said first plate;

means for irradiating each of said plates with infrared rays, said irradiating means being positioned to irradiate said plates through said sheets;

means for detecting the quantity of infrared rays reflected from each of said plates; and

means coupled to said detecting means for generating a signal indicating piled sheets being fed when the difference between the quantity of reflected rays from said first plate and the quantity of reflected rays from said second plate is below a predetermined level.

3,932,756

X-RAY DETECTOR FOR A PANORAMIC X-RAY DEVICE

David Cowell, Webster, and Frieder H. Ensslin, Rochester, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

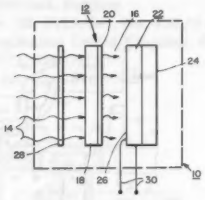
Filed June 24, 1974, Ser. No. 477,897

Int. Cl.² G01T *1/20*

U.S. Cl. 250—361 **6 Claims**

1. Apparatus for detecting the intensity of X-ray radiation received from an amplitude modulated X-ray source, said apparatus comprising:

solid state X-ray radiation detection means responsive to X-ray radiation to generate an electrical output signal the magnitude of which is a function of the intensity of the X-ray radiation wherein the response time of said detector means is sufficiently fast enough to follow the changes in X-ray intensity so that said output signal follows the amplitude of the envelope of the modulated X-ray; and



bandpass filter circuit means for transmitting signals at the modulation frequency while rejecting the signals having frequencies substantially higher and lower than said modulation frequency.

3,932,757

APPARATUS FOR PRODUCING A VISUAL REPRESENTATION OF A RADIOGRAPHIC SCAN

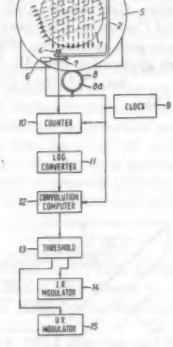
Godfrey Newbold Hounsfield, Newark, England, assignor to EMI Limited, Hayes, England

Filed Apr. 18, 1974, Ser. No. 462,103

Claims priority, application United Kingdom, May 5, 1973, 21524/73

Int. Cl.² G01T *1/20*

U.S. Cl. 250—365 **7 Claims**



1. Apparatus for examining a body by means of radiation such as X- or γ- radiation including means for deriving, from a planar region of the body, electrical signals indicative of the absorption suffered by the radiation on traversing a plurality of sets of linear paths through the body, means for transforming said electrical signals in accordance with a convoluting function, visual display means including a screen device for displaying, in respect of each of said paths, a visible line of brightness determined by the transformed electrical signal derived from that path, each displayed line being oriented upon said screen device at an angle corresponding to the angle of the corresponding linear path through said region of the body.

3,932,758

METHOD AND APPARATUS FOR DETERMINING THE DOSE VALUE OF NEUTRONS

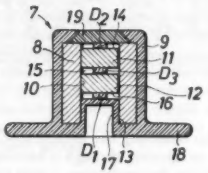
Bertram Burgkhardt, Karlsruhe, and Ernst Piesch, Leopoldshafen, both of Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Dec. 4, 1973, Ser. No. 421,648

Claims priority, application Germany, Dec. 8, 1972, 2260094

Int. Cl. G01t 3/00, 1/11

U.S. Cl. 250—390 21 Claims



1. Method for determining the dose value of neutrons leaving a body as thermal and intermediate neutrons after having been scattered in the body, comprising the steps of:

detecting on the surface of the body a first dose value of thermal and intermediate neutrons leaving the body by a first detector which is shielded against thermal and intermediate neutrons not emerging from the body,

detecting a second dose value of thermal and intermediate neutrons not emerging from the body by a second detector,

determining a first correction value based on the first and second values from a calibration diagram, and

applying said first correction factor to said first dose value to determine a corrected first dose value.

3,932,759

X-RAY DIAGNOSTIC INSTALLATION PROVIDING FOR THE FREE AND PROGRAMMED SETTING OF THE X-RAY EXPOSURE DATA

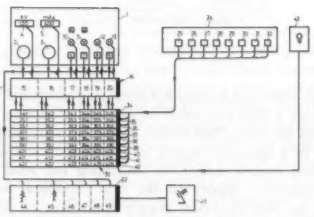
Bengt Brundin, Sollentuna, Sweden, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Mar. 1, 1974, Ser. No. 447,247

Claims priority, application Germany, Mar. 7, 1973, 2311211

Int. Cl.² H05G 1/30

U.S. Cl. 250—416 5 Claims



1. An X-ray diagnostic installation comprising means for the unrestricted setting and for setting of exposure data which are programmed dependent upon predetermined organs of a patient; an instrument panel; operating key means mounted on said instrument panel; data storage means connected to said data setting means; storage cell means in said storage means each having a particular exposure data program stored therein and associated with a respective one of said operating key means; and a programming switch connected to said instrument panel, said storage cell means adapted to store the currently set exposure data for an unrestricted data setting responsive to depression of the operating key associated therewith and the actuation of said program switch, and with said storage cells being connected with said setting means for the transmission of their stored contents to said setting means for an X-ray generator upon depression of the therewith associated operating key and with the programming switch being in a non-actuated position.

3,932,760

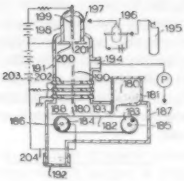
POWDER ACTIVATION IN AN INERT ATMOSPHERE

Kiyoshi Inoue, 16-8 3-chome, Kamiyoga, Setagaya, Tokyo, Japan

Division of Ser. No. 60,070, July 31, 1970, which is a continuation-in-part of Ser. No. 692,960, Dec. 22, 1967, Pat. No. 3,598,566. This application Apr. 11, 1973, Ser. No. 350,162

Int. Cl.² B22F 1/00

U.S. Cl. 250—492 20 Claims



1. Apparatus for activating metallic powder to improve its purity and to clean its surfaces from oxide film, moisture, and other impurities so that it becomes more chemically active and also is able to form denser blocks upon compacting or sintering, comprising

a treatment vessel,

means for holding the powder in said vessel in a fluidized state in a non-oxidizing gaseous atmosphere, and

means for bombarding said powder in said vessel with high energy particles chosen from the class consisting of ions and molecules.

3,932,761

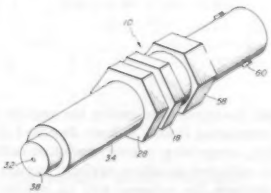
FIBER COUPLED LIGHT EMITTING DIODE MODULE

Hubert J. Ramsey, Burlington; Samuel M. Stone, Lynnfield, and Joseph Zucker, Waban, all of Mass., assignors to GTE Laboratories, Incorporated, Waltham, Mass.

Filed Nov. 18, 1974, Ser. No. 524,695

Int. Cl.² H01L 9/00

U.S. Cl. 250—552 8 Claims



1. A fiber coupled light emitting diode module comprising

a generally cylindrical, electrically conductive center support element,

a light emitting diode having two electrodes and being electrically, thermally and mechanically connected at its

base electrode to a first end surface of the support element,

a length of optical fiber optically coupled and mechanically affixed to the emitting area of the light emitting diode and extending generally axially away from the support element,

an adapter element formed of an electrically conductive material and having a generally axial through bore therein and an external surface to which accurate position indexing of the module may be made, the support element being positioned in one end of the through bore and being electrically insulated from and thermally connected to the adapter element, the optical fiber exiting from the other end of the through bore,

an inner rigid cylindrical sleeve having a generally axial bore therethrough sized to enable the end of the optical fiber exiting from the adapter element to be fixedly adhered therein with the optical fiber positioned generally parallel to the sleeve axis, the inner sleeve being positioned in and affixed to the end portion of the through bore in the adapter element so that the end of the optical fiber is located in a known relationship relative to the external surface so that efficient optical coupling may be accomplished to another optical fiber,

means for electrically connecting the other electrode of the light emitting diode to the adapter element, and

means for connecting the center support element and the adapter element to a suitable voltage source so that a voltage may be impressed across the light emitting diode whereby the light emitting diode module may be easily coupled into an optical fiber and operated efficiently as the heat generated is conducted away from the light emitting diode.

3,932,762

APPARATUS FOR MEASURING RADIATION ANGLE DEPENDENCE

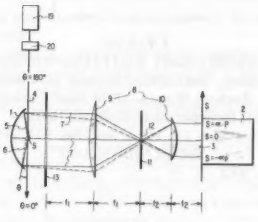
Herbert Moser, Leopoldshafen, Germany, assignor to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed July 29, 1974, Ser. No. 492,923

Claims priority, application Germany, July 28, 1973, 2338481

Int. Cl.² G01N *15/02, 21/26*

U.S. Cl. 250—574 **8 Claims**



1. Apparatus for rapidly measuring the angular dependence of radiation emanating from a volume disposed at a predetermined location, comprising: a local resolution radiation detector having a radiation-sensitive surface; means directing a laser beam through the volume; and an optical system disposed between the predetermined location and said radiation-sensitive surface to have its optical axis transverse to the axis of the beam, and constituting means creating an unequivocal correspondence between the angular direction of radiation from such volume and the point of impingement thereof on said radiation-sensitive surface.

3,932,763

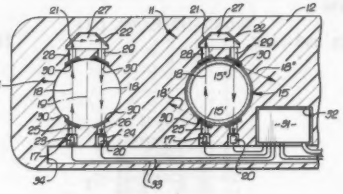
DETECTOR FOR TUBULAR TRANSPARENT ARTICLE

Harold Weinstein, Sherman Oaks, Calif., assignor to Sensor Technology, Inc., Chatsworth, Calif.

Filed July 29, 1974, Ser. No. 492,483

Int. Cl. G01n *21/24, 1/10*

U.S. Cl. 250—576 **9 Claims**



1. Apparatus for detecting the presence of a tubular transparent article in an opening through a housing, comprising;

light source means for projecting a light beam across said opening along a path offset from a transverse diameter of said opening, and

detector means, situated to receive said beam after it has traversed said opening, for detecting the intensity of said beam, said light beam being glazingly deflected by the curved surface of a tubular article in said opening, the resultant reduction in intensity detected by said detector means indicating the presence of said article in said opening.

3,932,764

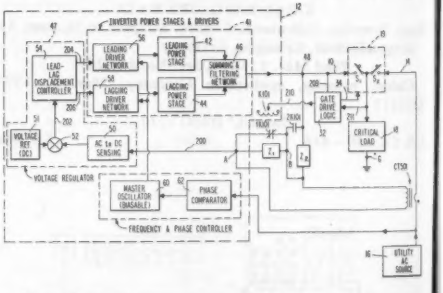
TRANSFER SWITCH AND TRANSIENT ELIMINATOR SYSTEM AND METHOD

Philip D. Corey, Raleigh, N.C., assignor to ESB Incorporated, Philadelphia, Pa.

Filed May 15, 1974, Ser. No. 470,284

Int. Cl.² H02J *9/00*

U.S. Cl. 307—85 **3 Claims**



1. In an electrical system for supplying electrical energy to a load from a first electrical supply and a second electrical supply and including first switch means for switching the load from the first electrical supply to the second electrical supply and second switch means for switching the load from the second electrical supply to the first electrical supply and wherein the first electrical supply comprises an inverter including voltage regulating means for regulating the output voltage of the inverter and phase control means for synchronizing the inverter to the second electrical supply the improvement comprising:

a. switch control means operatively connected to the first and second switch means for actuating the first and second switch means either alternately or simultaneously such that either the first or the second or both the first

and second electrical supplies may be utilized to supply electrical energy to the load;

b. current sensing means operatively connected to the voltage regulating and phase control means of the inverter and to the second electrical supply for sensing the current of the second electrical supply when both the first and second electrical supplies are simultaneously supplying the load and for providing control signals to the voltage regulating and phase control means of the inverter in response to sensed output current of the second electrical supply;

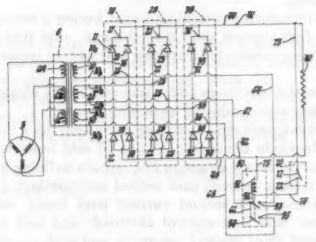
c. said voltage regulating and phase control means each being responsive to control signals from the current sensing means for adjusting the output voltage of the inverter and its relative phase so as to null the output current of the second electrical supply such that the first electrical supply is supplying the entire energy of the load; and

d. said switch control means being further operable to effect operation of the second switch means for switching the load from the second electrical supply solely to the first electrical supply when the current of the second electrical supply has been nulled.

3,932,765
POLYPHASE RECTIFIER SYSTEM FOR PROVIDING TWO OUTPUT CURRENT-VOLTAGE RANGES

Peter G. Townsend, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 1, 1974, Ser. No. 465,819
Int. Cl.² H02M 1/08
U.S. Cl. 307—149 **5 Claims**

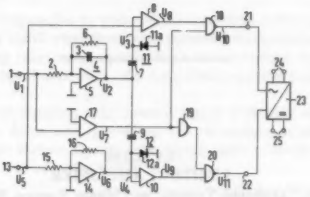


1. A polyphase rectifier system for providing two output current-voltage ranges upon the system direct current output circuit comprising in combination with a source of polyphase alternating current voltage of the type having an output electrical coil having two accessible terminal ends corresponding to each phase; a rectifier circuit corresponding to each phase of said source of polyphase alternating current voltage having alternating current input circuit means electrically connected to said terminal ends of said output electrical coil of the phase to which it corresponds and direct current output circuit means; means for connecting said direct current output circuit means of said rectifier circuits in parallel across said system direct current output circuit; and electrical switching means operable to the electrical circuit open and closed conditions for electrically interconnecting one said terminal end of all of said output electrical coils of said source of polyphase alternating current voltage when operated to the electrical circuit closed condition.

3,932,766
CONTROL SYSTEM FOR AN EXTERNALLY CONTROLLED CONVERTER

Damir Kudeljan, Montreal, Canada, and Klaus Rambold, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed July 23, 1973, Ser. No. 381,543
Claims priority, application Germany, July 24, 1972, 2236222
Int. Cl.² H03K 17/00
U.S. Cl. 307—229 **8 Claims**



1. In a control system for an externally controlled converter controlled by means providing an alternating current synchronizing voltage the improvement comprising:

a. a first input terminal for accepting the alternating current synchronizing voltage for said converter;

b. a second input terminal for accepting a variable d.c. control voltage representative of the desired converter output;

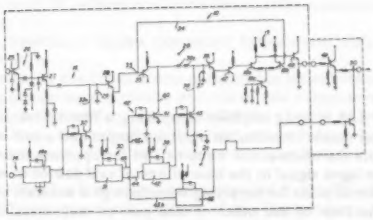
c. means coupled to said first terminal to develop a comparison voltage output which output is proportional to the voltage time area of synchronizing voltage; and

d. a first comparator having as an input said comparison voltage output and coupled to said second terminal to obtain said d.c. control voltage as a second input, the output of said comparator being coupled to provide firing pulses to the converter.

3,932,767
FILTER-DISCRIMINATOR CIRCUIT

Thiel J. Gomm, Castle Rock, and Stephen E. Price, Lakewood, both of Colo., assignors to Continental Charter Corporation, Arvada, Colo.

Filed July 23, 1973, Ser. No. 381,550
Int. Cl.² H03K 5/20
U.S. Cl. 307—235 R **4 Claims**



1. A filter-discriminator circuit comprising:

means for providing a train of pulses, the amplitude of each of which pulses is to be compared against adjacent pulses in the train;

a first sample and hold circuit that receives the train of pulses and extends the period of the pulses in said train;

a second sample and hold circuit adapted to receive the signal output from said first sample and hold circuit and

having means for delaying the signal passage therethrough by approximately the period of one input pulse;

a difference amplifier that receives the signal outputs from both the first and second sample and hold circuits comparing these signal outputs with one another producing, from that comparison, an output signal having pulses whose amplitudes equal the differences in amplitudes between compared pulses; and

clock means connected to said means for providing a train of pulses and to the difference amplifier for synchronizing the signal outputs with the input train of pulses.

3,932,768

LIMITING AMPLIFIER

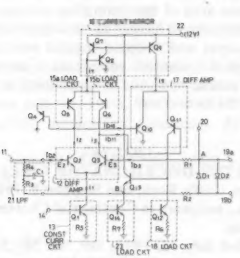
Nobuaki Takahashi, Yamato, and Masao Kasuga, Sagamihara, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Mar. 12, 1974, Ser. No. 450,394

Claims priority, application Japan, Mar. 15, 1973, 48-29472; Mar. 15, 1973, 48-31171[U]

Int. Cl.² H03K 5/08; H03G 3/30

U.S. Cl. 307—237 **15 Claims**



1. A limiting amplifier comprising: a first differential amplifier means including an input, an output and a pair of transistors therebetween; a circuit point for applying therethrough an input signal to the base of one of said pair of transistors; a circuit point for supplying therethrough a constant voltage to the base of the other of said pair of transistors; a second differential amplifier means including an input and an output, said second amplifier means being connected for amplifying the output of said first differential amplifier; a circuit point for applying as negative feedback a DC output component of said second differential amplifier to the base of said one of said pair of transistors of the first differential amplifier; and a limiting circuit means connected between an output point and the output side of said second differential amplifier and said constant voltage supplying circuit point for producing a limited output from said limiting amplifier.

3,932,769

CIRCUIT ARRANGEMENT FOR PRODUCING A DEFINED LOGIC CONDITION, PARTICULARLY FOR THE MONITORING SIGNAL OUTPUT IN DATA PROCESSING EQUIPMENT

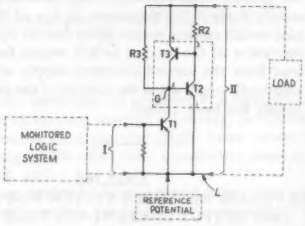
Werner Pollmeier, Veri, Germany, assignor to Nixdorf Computer AG, Paderborn, Germany

Filed June 17, 1974, Ser. No. 480,151

Claims priority, application Germany, June 18, 1973, 2330969

Int. Cl.² H03K 17/72

U.S. Cl. 307—252 G **4 Claims**



1. A circuit arrangement for transferring a logic condition, comprising:

means defining a pair of input terminals and means defining a pair of output terminals, one of said input terminals being connected by a common line to one of said output terminals;

first semiconductor switching means having a means defining a first current path therethrough, said first current path being connected between said pair of output terminals;

a first control electrode and a second control electrode for said first semiconductor switching means;

second semiconductor switching means having a third control electrode connected to one of said input terminals remote from said common line, means defining a second current path through said second semiconductor switching means, said second current path being connected between said first control electrode and said common line, said third control electrode and said common line thereby defining said pair of input terminals;

means for applying a reference potential to said common line; and

control means for effecting a conduction of said first semiconductor switching means in response to a nonconduction of said second semiconductor switching means and a nonconduction of said first semiconducting switching means in response to a conduction of said second semiconductor switching means, said control means comprising first resistance means connected between said first control electrode and one of said output terminals separate from said common line and second resistance means connected between said second control electrode and said one of said output terminals separate from said common line whereby the impedence of said circuit arrangement across said pair of output terminals is controlled by a predefined change in signal input to said pair of input terminals to change the state of conduction of said second semiconductor switching means to cause said circuit arrangement to deliver a defined logic condition at said pair of output terminals.

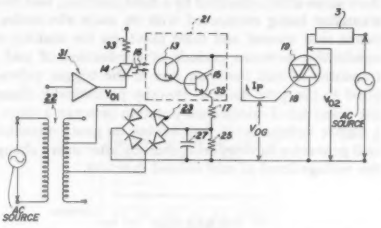
3,932,770
CONTROL CIRCUIT FOR SWITCHING TRIACS

Louis John Fantozzi, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 338,808, March 7, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,664

Int. Cl.² H03K *17/00*

U.S. Cl. 307—252 UA **4 Claims**



1. In a circuit comprising: an A.C. source; a load; and a TRIAC for supplying A.C. power to said load from said A.C. source, said TRIAC including first and second gating electrodes, said first electrode being connected in series with said load and said A.C. source being applied across said TRIAC and said load, the improvement wherein, a trigger circuit is provided for said TRIAC comprising:

a photodarlington circuit,

means for biasing said photodarlington circuit to its quiescent state in the absence of a light signal; and

means for making said photodarlington circuit conductive and for enabling it to apply a negative voltage to the gate electrode of said TRIAC to make said TRIAC conductive in the presence of a light signal applied to said photodarlington circuit.

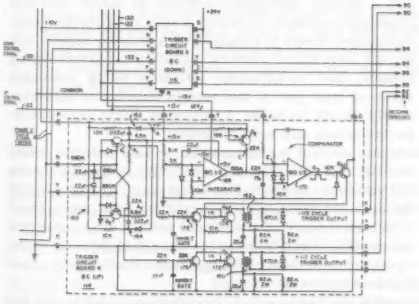
3,932,771
CONTROL FOR THREE PHASE A.C. MOTOR

Jiri B. Bucek, State College, and James R. Shultz, York, both of Pa., assignors to Fincor, Inc., York, Pa.

Division of Ser. No. 238,141, March 27, 1972, Pat. No. 3,826,928, which is a division of Ser. No. 62,869, Aug. 11, 1970, Pat. No. 3,678,355. This application Jan. 30, 1974, Ser. No. 438,072

Int. Cl.² H03K *5/04*

U.S. Cl. 307—265 **2 Claims**



1. A solid state trigger circuit to provide variable period output signals within a timed sequence of signals for controlling conduction angle firing of thyratron type switching devices in an A.C. phase line comprising:

a bi-stable multivibrator with a first and a second input and a first and a second output which are coupled to form a third output;

timing means providing successive timing signals derived from the alternating current in said phase line to be 180° out of phase with each other, said timing signals respectively being alternately applied to a corresponding one of said first and said second inputs of said multivibrator to oscillate said multivibrator at a desired timing rate, said first and said second outputs of said multivibrator providing a voltage transition spike at said third output at the beginning of each positive half cycle of said timing signals;

means responsive to said voltage transition spike to provide a saw tooth wave form with periods corresponding to said timing rate; means providing a linear voltage input control signal indicative of a desired time period pulse width; and

means comparing said control signal with said saw tooth wave form and providing corresponding square wave trigger output signals with signal pulse periods equal to said desired pulse width.

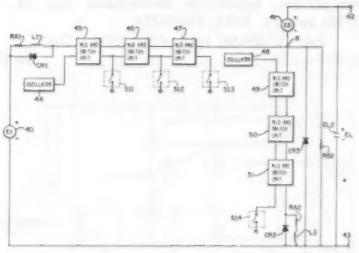
3,932,772
HIGH VOLTAGE SWITCHING GENERATOR

Paul W. Graves, Marlborough, and Constantine Rhodes, Sudbury, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sept. 27, 1974, Ser. No. 509,856

Int. Cl.² H03K *1/14*

U.S. Cl. 307—264 **7 Claims**



1. Voltage switching apparatus including

a pair of input terminals;

a pair of output terminals;

a source of DC voltage connected between the input terminals;

load capacitance means connected between the output terminals;

a plurality of non-linear means connected in series between one of said input terminals and one of said output terminals, the current-voltage characteristic of each of said non-linear means having a threshold voltage below which conductance is low and above which conductance increases steeply;

a plurality of switch means, each connected in parallel with a different one of said plurality of non-linear means;

switch driving means for producing energizing pulses;

control means for selectively applying the energizing pulses from said switch driving means to the switch means of said plurality;

each switch means being operable when energizing pulses from said switch driving means are applied thereto to short-circuit the non-linear means in parallel therewith whereby the voltage across said load capacitance means is increased by an amount equal to the threshold voltage of the non-linear means in parallel with a short circuit and

said switch means being operable in the absence of energizing pulses from said switch driving means to provide an open circuit across the non-linear means in parallel therewith whereby the voltage across said load capacitance means is decreased by an amount equal to the threshold voltage of the non-linear means in parallel with an open circuit;

additional non-linear means coupled between said one of said output terminals and the other of said output terminals, the threshold voltage of said additional non-linear means being greater than the total of the threshold voltages of said plurality of non-linear means;

additional switch means connected in parallel with said additional non-linear means; and

additional switch driving means for selectively applying an energizing signal to said additional means;

said additional switch means being operable in the absence of an energizing signal from said additional switch driving means to provide an open circuit across said additional non-linear means, and said additional switch means being operable in response to an energizing signal from said additional switch driving means to short-circuit said additional non-linear means whereby the voltage across said load capacitance means is rapidly reduced.

3,932,773
CONTROL SYSTEM FOR PERIODICALLY ENERGIZING A CAPACITIVE LOAD

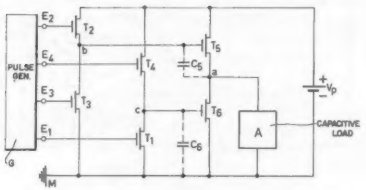
Jakob Lüscher, 20b, route de Drize, 1227 Carouge, Geneva, and Andre Rusznyak, 28, avenue Pierre-Odier, 1208 Geneva, both of Switzerland

Filed July 20, 1973, Ser. No. 380,971

Claims priority, application Switzerland, July 21, 1972, 010985/72; July 11, 1973, 10086/73

Int. Cl.² H03K *1/18, 4/58, 5/04, 17/60*

U.S. Cl. 307—270 **10 Claims**



1. An electronic control system comprising:

a capacitive load to be energized with a recurrent sustained binary signal;

a generator of periodic trigger pulses of a duration representing a small fraction of their repetition period;

a supply of direct current with a positive and a negative pole; and

a set of field-effect transistors connected between said generator and said load, each of said transistors having a pair of main electrodes and a gate insulated from said main electrodes, said set including a first pair of transistors with main electrodes serially connected across said supply forming a first junction therebetween, a second pair of transistors with main electrodes serially connected across said supply forming a second junction therebetween, and a further transistor, one transistor of said first pair having its gate connected to said generator for periodic energization by said trigger pulses, said one transistor of said first pair having a main electrode connected to one pole of said supply, one transistor of said second pair having its gate connected to said first junction and having a main electrode connected to said one pole, said load being connected to said second junction;

said one transistor of said second pair having an input capacitance effective between its gate and said second junction which is small compared to the capacitance of said load whereby the potential of said second junction changes substantially more slowly than the potential of said first junction, each transistor of said second pair in its conductive state forming with said load a network of a time constant long enough to make the transition between said levels outlast the duration of said trigger pulses;

the other transistors of said pairs having main electrodes connected to the other pole of said supply and having their gates interconnected by a third junction, said further transistor being connected with its main electrodes between said second and third junctions for making same conductive between periods of conduction of said one transistor of said first pair due to the trigger pulses applied to the gate thereof, thereby periodically changing the potential of said second junction between a lower and a higher voltage level, and having its gate connected to said generator for triggering thereby after every change in the voltage level of said second junction.

3,932,774
ELECTRONIC MONITORING SYSTEM WITH SHORT-CIRCUIT PROTECTION

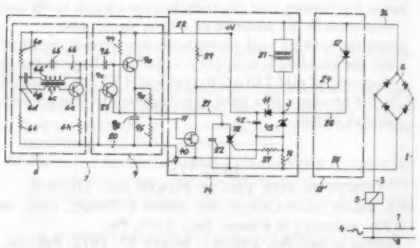
Robert Buck, Kirchbuhlweg 128, Neukirch, Germany

Filed June 24, 1974, Ser. No. 482,478

Claims priority, application Germany, June 22, 1973, 2331732

Int. Cl.² H01H *36/00;* **G08B** *13/26;* **H03K** *17/08, 17/72*

U.S. Cl. 307—308 **10 Claims**



1. An electronic monitoring system comprising:

detector means sensitive to an ambient condition for generating an output signal varying with a change in said condition, said detector means being provided with a pair of power-input terminals;

a voltage divider consisting of a first impedance network and a second impedance network in series, said first impedance network including a voltage-controlled semiconductive device in parallel with a resistive branch, said second impedance network including a current-sensing resistor, said power-input terminals being connected across at least part of said second impedance network;

a supply circuit including a source of direct current connected across said voltage divider;

electronic control means coupled to said detector means and connected to said semiconductive device for altering the conductivity thereof in response to changes in said ambient condition, thereby modifying said output signal with maintenance of a sufficient voltage drop across said second impedance network to keep said detector means operative regardless of changes in the conductivity of said semiconductive device; and

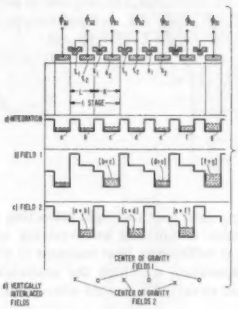
a bistable electronic switch operatively coupled to said first impedance network and provided with a trigger circuit connected across said current-sensing resistor for open-circuiting said semiconductive device in response to a current flow through said second impedance network exceeding a predetermined limit.

3,932,775

INTERLACED READOUT OF CHARGE STORED IN A CHARGE COUPLED IMAGE SENSING ARRAY

Walter Frank Kosonocky, Skillman, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 25, 1974, Ser. No. 491,812
Int. Cl.[2] H01L 27/10, 29/78, 31/10
U.S. Cl. 307—311 5 Claims



3. A charge coupled image sensing system comprising:

an array of stages, each including a half stage I_a and a half stage I_b, each half stage including means responsive to radiation for producing a charge signal;

means for applying voltages to each half stage during first and second integration times for causing each half stage to store charge signal;

means for producing a first field, after said first integration time, comprising means for controlling the value of said voltages for shifting the charge signal stored in each half stage I_a to the following half stage I_b, and for shifting the combined charge signals stored in the half stages

means, after said second integration time, for producing a second field which may be interlaced with the first, comprising means for controlling the value of said voltages for shifting the charge signal stored in each half I_b of one stage to the half I_a of the following stage, and then shifting the combined charge signals stored in the half stages I_a out of the array.

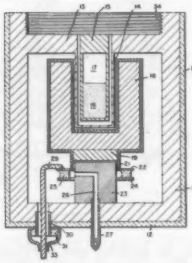
3,932,776

COLD FUEL THERMIONIC CONVERTER

John B. Dunlay, and Robert C. Howard, both of Wayland, Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Dec. 9, 1966, Ser. No. 600,488
Int. Cl. H01j 45/00
U.S. Cl. 310—4 2 Claims

1. An energy conversion system comprising an externally insulated housing, a heat sink in the shape of an open-ended receptacle, a capsule of isotope fuel disposed in said heat sink and having a portion thereof extending beyond said, said heat sink being thermally insulated from said capsule and disposed in said housing to receive gamma radiation from said capsule, and a heat utilization device disposed in heat-transfer relationship to said heat sink for deriving heat therefrom, said housing



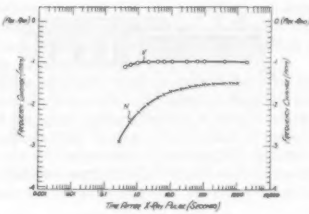
including a portion thereof in heat-transfer relationship with said portion of said capsule extending beyond said heat sink.

3,932,777

VACUUM ELECTROLYSIS OF QUARTZ

James Claude King, Albuquerque, N. Mex., assignor to Bliley Electric Company, Erie, Pa.

Filed Nov. 29, 1974, Ser. No. 528,552
Int. Cl.[2] H01L 41/10
U.S. Cl. 310—8 14 Claims



1. A method of processing crystal quartz material comprising the steps of,

maintaining the quartz at thermal equilibrium at a temperature of 500°C to 570°C in an atmosphere substantially free of hydrogen, while

applying an electric field along the Z-axis of the crystal quartz between anode and cathode electrodes of a strength from 1 to 5 kV/cm for a period of 72 to 120 hours, and

maintaining said electric field while said crystal is cooled.

3,932,778

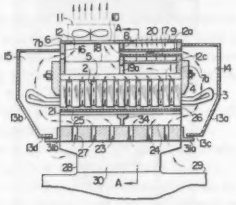
COOLING DEVICE FOR AN ELECTRIC ROTARY MACHINE

Masatoshi Watanabe; Noriyoshi Takahashi, and Ichiro Nagata, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 9, 1974, Ser. No. 459,341
Claims priority, application Japan, Apr. 9, 1973, 48-39561
Int. Cl.[2] H02K 1/32
U.S. Cl. 310—61 8 Claims

1. A cooling device for an electric rotary machine comprising a rotor adapted to rotate together with a rotary shaft, said rotor including a plurality of salient poles affixed to a yoke and having a plurality of radially oriented fluid passageways

formed in the yoke and each interposed between the adjacent poles, a stator including coils and cores and mounted around an outer periphery of said rotor with a predetermined clearance interposed between them, and a plurality of end covers each mounted on one of axial opposite ends of said stator in



such a manner as to enclose end portions of said coils and each including an inner peripheral portion which is in spaced juxtaposed relationship with respect to one axial opposite ends of the yoke with a very small clearance interposed therebetween.

3,932,779

TURBO-GENERATOR ROTOR WITH A ROTOR WINDING AND A METHOD OF SECURING THE ROTOR WINDING

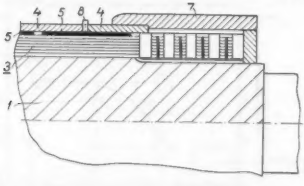
Kristian Dahl Madsen, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 5, 1974, Ser. No. 448,367

Claims priority, application Sweden, Mar. 22, 1973, 7304036

Int. Cl.² H02K *3/36*

U.S. Cl. 310—215 **2 Claims**



1. A turbo-generator rotor provided with a plurality of rotor slots, comprising a rotor winding in the slots, a plurality of axially and consecutively arranged slot wedges of a material of high electrical conductivity and at least one mechanically securing and electrically connecting member for said wedges, said member comprising a metal pressure tube (5), which is closed at both ends and filled with a solidified resin (6), each pressure tube electrically bridging over transition zones between the axially and consecutively arranged slot wedges, and short-circuiting means electrically connecting the end wedges of the slots with each other so that a damping winding is formed.

3,932,780

ELECTRIC LAMP HAVING AN ENVELOPE WITH A SPECULAR LIGHT-REFLECTIVE COATING OF ORIENTED ALUMINUM PARTICLES

Aristide R. DeCaro, Edison; Eugene F. Murphy, Pompton Plains, both of N.J., and Billy A. Maynard, Lexington, Ky., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 20, 1974, Ser. No. 452,864

Int. Cl.² H01K *1/32*

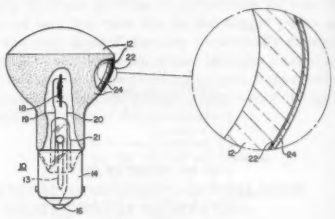
U.S. Cl. 313—113 **13 Claims**

1. An electric lamp comprising:

a sealed envelope of vitreous light-transmitting material,

a light source within said envelope that also generates heat when the lamp is energized and thereby heats said envelope to an elevated temperature when the lamp is operated and is in use,

an adherent film of minute aluminum particles on the exterior surface of a selected portion of said envelope, said film being of such thickness and said aluminum particles being of such configuration and size and being so oriented that the surface of the film which is in contact with the envelope is specular and thereby constitutes an integral reflector for impinging light rays produced by said light source, and



means protecting said specular light-reflecting film of aluminum particles comprising an overlying coating of a material that is sufficiently heat-resistant to withstand the elevated temperature to which the underlying selected portion of said envelope is heated when the lamp is energized,

a portion of said envelope that is not covered by said specular light-reflecting film of aluminum particles being disposed in the path of reflected light rays and thereby constituting the light-transmitting portion of said envelope.

3,932,781

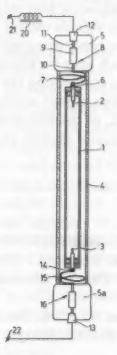
HIGH PRESSURE SODIUM VAPOR DISCHARGE LAMP

Jozef C. I. Peeters, Lucien Joannes Maria De Roeck, and Henricus Johannes Joseph Van Boort, all of the Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 26, 1973, Ser. No. 335,561

Int. Cl.² H01J *61/22, 61/52*

U.S. Cl. 313/25 **4 Claims**



2. A high-pressure sodium vapor discharge lamp comprising:

a discharge tube having a internal electrode at each end of said tube, the wall of said discharge tube consisting of densely sintered alumina;

an outer quartz envelope encompassing said tube, the dis-

tance between the tube and envelope being no greater than 5 mm, and

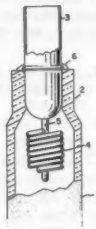
an inert gas being present between the discharge tube and the outer envelope, the pressure of said gas being greater than 200 Torr.

3,932,782

HIGH PRESSURE SODIUM VAPOR LAMP HAVING IMPROVED MONOLITHIC ALUMINA ARC TUBE

Bernard Kopelman, Magnolia, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Continuation of Ser. No. 352,970, April 20, 1973, abandoned.
This application Feb. 26, 1975, Ser. No. 553,356
Int. Cl.² H01J 61/30, 61/18
U.S. Cl. 313—220 3 Claims



1. A high pressure sodium vapor lamp comprising a monolithic polycrystalline alumina arc tube having electrodes disposed at the ends thereof and containing a fill including sodium, mercury and inert gas, said arc tube consisting of a tubular body portion and two end portions, the outside diameter of said end portions being smaller than the outside diameter of said body portion, there being no sealing region between said end portion and said body portion, said body portion having a uniform inside diameter throughout its length, each of said end portions having an axial hole therethrough, the diameter of said axial hole being smaller than the inside diameter of the body portion, cylindrical metallic members extending through and sealed to said end portions, said electrodes being supported on metal rods extending from the internal ends of said metallic members.

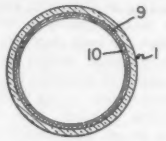
3,932,783

FLUORESCENT LAMP CONTAINING INDIUM OXIDE

Richard A. Meneily, Danvers, and Tadius T. Sadoski, Salem, both of Mass., assignors to Sylvania Electric Products Inc., Danvers, Mass.

Continuation of Ser. No. 788,509, Jan. 2, 1969, abandoned.
This application Feb. 14, 1972, Ser. No. 199,701
Int. Cl.² H01J 63/04, 61/28
U.S. Cl. 313—492 3 Claims

1. A tubular fluorescent lamp comprising a sealed light-transmitting envelope, electrodes therein, a gaseous filling therein, mercury vapor therein, and a substantially transparent coating of indium oxide on the inside surface of said envelope, said indium oxide having the indium in a state of oxidation lower than in In_2O_3.

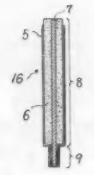


3,932,784

DOUBLE SECTION CARBON ELECTRODE

Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan

Filed Aug. 26, 1974, Ser. No. 500,466
Int. Cl.² H05B 31/10
U.S. Cl. 314—60 4 Claims



1. A carbon electrode for use in carbon arc lamps of the type wherein a plurality of electrodes are clamped to a support which is connected to a power source, said carbon electrode comprising:

an elongate electrode body of carbon material having imbedded therein a core of luminous material and having about the outer surface thereof a metal coating;

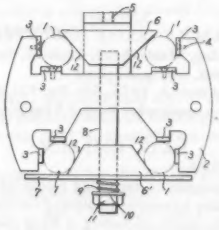
said electrode body having a first section of uniform diameter and a second section of substantially greater diameter than said first section, said second section having a solid uniform thickness throughout the entire length thereof.

3,932,785

CARBON ELECTRODE SUPPORT

Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan

Filed Aug. 26, 1974, Ser. No. 500,472
Int. Cl.² H05B 31/18
U.S. Cl. 314—130 5 Claims



1. A holding device for clamping at least a plurality of carbon electrodes, particularly for use in a carbon arc lamp, said holding device comprising:

a support element having two support areas for each electrode to be clamped;

each said pair of support areas having fixed thereto a pair of conducting means for forming a pair of contact surfaces for contacting an electrode; and

clamping device means, having a third non-conductive contacting surface for each electrode to be clamped, for clamping each electrode against its respective pair of conducting means, said clamping device means comprising a first clamping body having thereon plural non-conductive contacting surfaces, a second clamping body having thereon plural non-conductive contacting surfaces, and means for biasing said first and second clamping bodies toward each other.

3,932,786

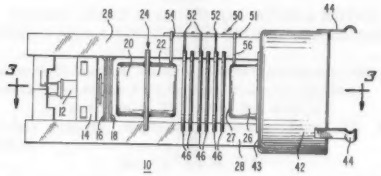
ELECTRON GUN WITH A MULTI-ELEMENT ELECTRON LENS

Francis Joseph Campbell, Yardley, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,400

Int. Cl.² H01T *29/29*; H01J *29/82*

U.S. Cl. 315—3 **8 Claims**



1. In an electron gun structure for producing and directing at least one electron beam along a beam path, said gun including a cathode, a control grid electrode, a screen grid electrode, a first accelerating and focusing electrode and a second accelerating and focusing electrode, spaced respectively along the beam path, the improvement comprising:

a plurality of spaced electrode plates positioned between said first focusing and accelerating electrode and said second focusing and accelerating electrode for expanding the focusing lens fields in the path of the beam, each plate having an aperture therethrough aligned with said beam path;

supporting means connecting said electrode plates; and

resistive means attached at one end to said first accelerating and focusing electrode and at a second end to said second focusing and accelerating electrode and attached to said spaced electrode plates at spaced points between the ends of said resistive means, said resistive means being on said support means.

3,932,787

TUNABLE COAXIAL MAGNETRONS

Alan Butler Cutting, Maidenhead, England, assignor to E M I - Varian Limited, Hayes, England

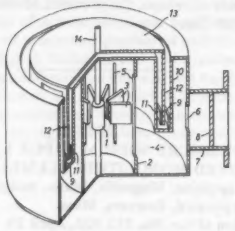
Filed Nov. 6, 1974, Ser. No. 521,535

Claims priority, application United Kingdom, Nov. 7, 1973, 51646/73

Int. Cl.² H01J *25/50*

U.S. Cl. 315—39.61 **6 Claims**

1. A coaxial magnetron including a resonator cavity and a wall means forming a coupled stabilizing cavity, and a stabilizing cavity tuning means including a fixed dielectric portion supporting a fixed conductive tuning element at the middle of the cavity and a movable dielectric portion supporting a movable conductive tuning element for rotation through the middle of the cavity to either overlap or not overlap the fixed element, neither the fixed tuning element or the movable tuning element extending to the wall of the stabilizing cavity, the movable tuning element being capable of continuous



unidirectional rotational displacement to vary said overlap and thereby vary the frequency of the magnetron.

3,932,788

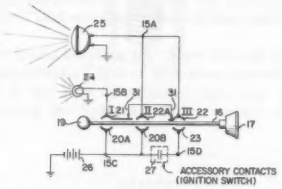
AUTOMOBILE HEADLIGHT SWITCH

Robert Guy Groover, Savannah, Ga., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Sept. 17, 1974, Ser. No. 506,768

Int. Cl.² B60Q *1/04*

U.S. Cl. 315—82 **1 Claim**



1. A light switch fitted with an operating arm for controlling various lights of a vehicle controlled by an ignition switch which provides for a first position of the operating arm in which all lights of the vehicle are OFF, a second position of the operating arm in which only the parking lights and taillights are ON, a third position of the operating arm in which only the headlights and taillights are ON and a fourth position in which only the headlights and taillights of the vehicle are ON when the ignition switch of the vehicle is also ON,

said light switch formed of an enclosure in which concave metal contacts are individually mounted about an operating arm mounted to move in an axial direction with respect to the enclosure, with one end of the arm projecting beyond an end of the enclosure and fitted with a knob as a manual grip,

said arm fitted with an enlarged section of the arm inside the enclosure, with the exterior of said enlarged section formed of electrically conducting material,

said enlarged section fixed in position on said arm, and said concave metal contacts fixed in position to said enclosure such that when the operating arm is slid axially to a first position of the operating arm, the enlarged section does not touch any of the contact members, when the operating arm is slid to

a second position of the operating arm, the enlarged section contacts both a first and a second metal contact, when the operating arm is slid to

a third position of the operating arm, the enlarged section contacts both a third and a fourth metal contact, and when the operating arm is slid to

a fourth position of the operating arm, the enlarged section contacts both a fifth and a sixth metal contact,

said metal contact being spring mounted to the enclosure to move in a direction perpendicular to the axis of the arm towards the enclosure when contacted by the enlarged section of the arm, with

the second and third contact members electrically connected together and connected to an external terminal for electrical connection to the battery circuit of the vehicle,

the first contact member electrically connected to an external terminal for connection to the taillight and parking light circuit of the vehicle,

the fourth and fifth metal contact members electrically connected together and connected to an external terminal for connection to the headlight circuit of the vehicle,

the sixth metal contact electrically connected to an external terminal for connection to an accessory contact of the ignition switch of the vehicle,

said first contact member formed with a flange that extends adjacent to the fourth and the fifth contact members between said contact members and the enclosure, with said flange located so as to be electrically contacted by either the fourth or the fifth contact member when the fourth or the fifth contact member is contacted by the enlarged sections of the arm,

said accessory contact of the ignition switch being connected to the battery circuit when the ignition switch is in the ON position.

3,932,789

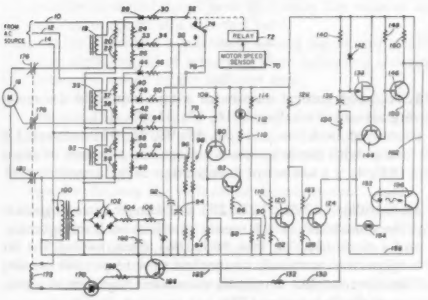
CURRENT SENSING PROTECTOR SYSTEM FOR A. C. MOTORS

James E. Sons, Sanger, and Wayne C. Starnes, Dallas, both of Tex., assignors to Detprotector, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 412,809, Nov. 5, 1973. This application Apr. 25, 1974, Ser. No. 464,112

Int. Cl.² H02H *7/085*

U.S. Cl. 317—13 R **2 Claims**



1. A system for preventing current overload in a multiphase multi-speed alternating current motor in low and high speeds comprising:

current transformers for sensing the current level in each of said phases of said motor,

a resistor divider network connected to each of said sensing means and including a low speed configuration and a high speed configuration,

means responsive to low speed operation of said motor for connecting the outputs of each of said low speed configurations to a summing location and further responsive to high speed operation of said motor for connecting the outputs of each of said high speed configurations to the summing location,

a differential amplifier responsive to the voltage at the summing location for generating an overload signal upon the occurrence of an overload current in any of said phases,

a triac connected to control current flow through said phases,

a switching transistor operable in response to said overload signal for switching said triac to terminate current flow through said phases,

a light emitting device connected to said switching transistor for emitting light upon the occurrence of said overload signal,

a timing circuit including a field effect transistor connected to control said switching transistor and a timing capacitor for controlling the state of the field effect transistor, and

light sensor means for sensing said light and for initiating a timing cycle by said timing circuit during which said triac may not be switched to allow current flow through said phases.

3,932,790

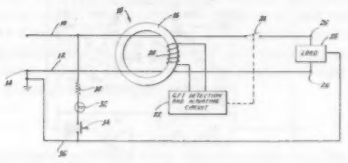
GROUND FAULT INTERRUPTER WITH REVERSED LINE POLARITY LAMP INDICATOR

Paul Muchnick, Norwalk, Conn., assignor to Harvey Hubbell, Incorporated, Bridgeport, Conn.

Filed Feb. 22, 1972, Ser. No. 228,075

Int. Cl.² H02H *1/02*; **G08B** *21/00*

U.S. Cl. 317—18 D **8 Claims**



1. A ground fault interrupter comprising:

a pair of conductors having input terminals adapted to be connected to an AC power supply having a line and a grounded neutral, and output terminals adapted to be connected to a load;

circuit breaker means connected in series with a first of said conductors;

current sensing means for sensing differences in current flowing in said conductors and generating a signal responsive thereto;

detection and actuation means for receiving said signal and opening said circuit breaker means when said signal indicates a difference current of a predetermined magnitude, and

reversed line polarity indicating means associated with said conductors for indicating proper connection of said first of said conductors to said line of said AC power supply, said reversed line polarity indicating means including circuit means for giving an indication of whether or not said first of said conductors is connected to said line of said AC power supply, and actuating means for selectively connecting said circuit means between one of said conductors and ground.

3,932,791

MULTI-RANGE, HIGH-SPEED A.C. OVER-CURRENT PROTECTION MEANS INCLUDING A STATIC SWITCH

Joseph V. Oswald, 2852 S. Central Park Ave., Chicago, Ill. 60623

Continuation-in-part of Ser. No. 325,812, Jan. 22, 1973, abandoned. This application Feb. 7, 1974, Ser. No. 440,585

Int. Cl.² H02H *3/08*

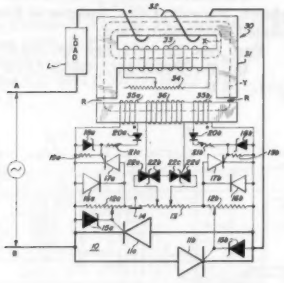
U.S. Cl. 317—33 SC **8 Claims**

1. In an electronic circuit breaker having semiconductor switch means connectible between a source of power and a load for removing power from the load when current therethrough exceeds a selected overload level, a circuit for selectively varying said overload response level, comprising:

a transformer having a primary winding connected in series with said semiconductor switch and a secondary winding inductively coupled with said primary winding, a voltage being developed across said secondary winding directly proportional to the current through said primary winding and semiconductor switch, the proportional factor depending upon the inductive coupling between the primary and secondary winding;

a switch control circuit responsive to the voltage developed across said secondary winding exceeding a predetermined magnitude to cause said semiconductor switch to assume a nonconductive state, thereby removing power from the load; and

means associated with said transformer manually operable to selectively vary the inductive coupling between the primary winding and the secondary winding whereby the



overload level corresponding to said predetermined voltage magnitude across the secondary winding may be selectively varied, said inductive coupling varying means including

a magnetic core for said transformer having a first leg around which the primary winding is wound, a second leg around which the secondary winding is wound in parallel magnetic circuit with said first leg, and a third leg in parallel magnetic circuit with said first and second legs,

a control winding wound around said third leg and closed upon itself through a variable resistor for varying the effective reluctance of said third leg, and

means for varying the reluctance of one of said first and second legs including a reluctance gap in one of said first and second legs and means for selectively varying said gap.

3,932,792

SEALED PUMP AND DRIVE CIRCUITS THEREFOR

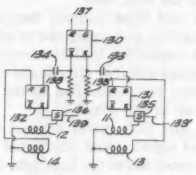
Philip E. Massie, 4220 Irving Place, Culver City, Calif. 90230

Division of Ser. No. 308,044, Nov. 20, 1972, Pat. No. 3,846,682, which is a division of Ser. No. 113,321, Feb. 8, 1971, Pat. No. 3,754,154. This application Aug. 19, 1974, Ser. No. 498,761

Int. Cl.[2] H02K *33/12*

U.S. Cl. 318—119 **5 Claims**

1. A reciprocating electrical machine comprising: a magnetically actuatable reciprocatable armature and means supporting it for movement; permanent magnet means associated with the armature and supporting means; electrical winding means disposed to produce a magnetic field for reciprocating the armature in association with the field of the permanent magnet; driving means comprising a source of electrical pulses; means for applying pulses alternately to each of said winding means to cause said armature to be reciprocated; switch means controlling power to each of said windings; an additional pair of windings in coupling relationship with said first windings; first and second flip-flop means connected to control the switch means associated with said first windings; said additional pair of windings being connected to said first and



second flip-flop means; and said source of electrical pulses being connected to said first and second flip-flop means.

3,932,793

SPEED CONTROL CIRCUIT FOR PERMANENT MAGNET D-C MOTORS

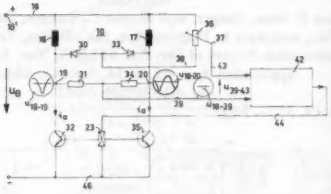
Rolf Müller, St. Georgen, Germany, assignor to Papst-Motoren KG, St. Georgen, Germany

Filed Mar. 18, 1974, Ser. No. 451,869

Claims priority, application Germany, Mar. 22, 1973, 2314257

Int. Cl.[2] H02K *29/02*

U.S. Cl. 318—138 **18 Claims**



1. A speed control circuit for a constant field d-c motor having armature windings (**16, 17; 81, 82, 83**),

controlled switch means (**32, 35; 95, 96, 97**) connected in series with the armature windings and a source of power (**18'**; +, −) to control energization of the armature windings,

a controller (**42-56; 117-125**) providing control signals to the controlled switch means to effect such energization,

and a diode (**30, 33; 104, 105, 106**), each, having first like respective terminals connected to a respective winding and second like terminals connected together at a common diode junction (**38**);

characterized in that

the diodes are poled to be conductive during current flow from the source through respective switch means to the respective windings to derive, across the respective *n* windings, a first control voltage ($u_{18\text{-}38}$) which is representative of a composite of the emf (E) induced by the field of the rotor in the respective windings, and the resistance voltage drop ($i_a \cdot R_a$) due to current flow through the respective *n* armature windings;

a resistor (**31, 34; 101, 102, 103**), each, is provided having first respective terminals connected to a respective winding of said *n* windings and second terminals connected together to a common resistor junction (**39**) to derive, across the respective winding, a second control voltage ($u_{18\text{-}39}$) which is representative of $1/n$ of the resistance voltage drop ($i_a \cdot R_a$) due to current flow through the *n* armature windings;

means (**36, 37; 50; 58, 60; 113**) weighting and normalizing said first and second control voltages with respect to each other by the factor of *n;*

and means (42; 62, 116) comparing said first and second normalized, weighted control voltages and forming a difference control signal ($u_{30\text{-}42}$; $u_{51\text{-}30}$),

the controller (42–56; 117–125) controlling energization of the controlled switch means (32, 35; 95, 96, 97) under command of said difference control signal.

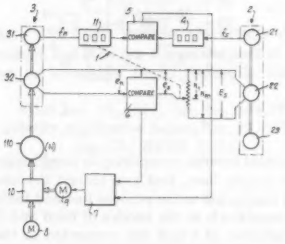
3,932,794
REVOLUTION SPEED CONTROLLER USING BOTH ANALOG AND DIGITAL CONTROL

Hiroyuki Iwako, Tokyo, Japan, assignor to Funken Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 369,128, June 12, 1973, abandoned. This application Feb. 20, 1975, Ser. No. 551,156

Int. Cl.² H02P *5/06*

U.S. Cl. 318—318 **10 Claims**



1. A revolution speed controller for a rotatable follower unit having a defined range of operating revolution speeds, comprising:

means for monitoring the revolution speed of the follower unit and for providing a monitored analog signal and a monitored digital signal each indicating the value of said revolution speed at a selected time;

means for providing a reference analog signal and a reference digital signal of selected values indicating a desired revolution speed of the follower unit;

means for comparing the monitored analog signal with the reference analog signal and for providing a first error signal reflecting the difference therebetween;

means for comparing the monitored digital signal and the reference digital signal and for providing a second error signal reflecting the difference therebetween;

wherein each of said first and second error signal ranges in value over substantially the entire range of the operating revolution speeds of the follower units; and

means for combining the first and the second error signal to provide a combined control signal reflecting the difference, if any, between the two error signals, said control signal indicating the degree of correction needed to conform the actual revolution speed of the follow unit to the desired revolution speed thereof.

3,932,795
SERVO CONTROL POSITIONING APPARATUS INCLUDING A STANDING WAVE DETECTOR

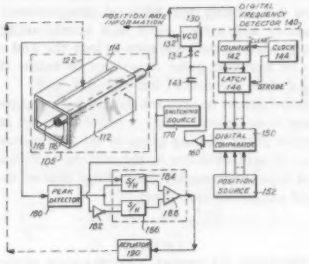
Jans Kliphuis, 124 Southdown Road, Huntington, N.Y. 11743

Filed Nov. 19, 1973, Ser. No. 417,143

Int. Cl.² G05B *1/06*

U.S. Cl. 318—669 **8 Claims**

1. In combination in automated positioning apparatus, an electrical wave propagating structure having a characteristic impedance, means terminating said wave propagating structure in other than its characteristic impedance, probe means coupled to said electric wave propagating structure and adapted for relative movement with respect thereto, a voltage controlled oscillator for supplying an electrical wave to said wave propagating structure, said voltage controlled oscillator thereby impressing a standing wave on said wave propagating structure, first feedback means, including input command means, for controlling the output frequency of said voltage controlled oscillator, thereby also determining node positioning for said standing wave pattern, and second feedback loop means for positioning and maintaining said probe means at a



standing wave pattern node, said second feedback means including means for detecting the position of said probe relative to a node of said standing wave pattern, and actuator means responsive to the output of said detecting means for selectively moving said probe means relative to said electric wave propagating structure.

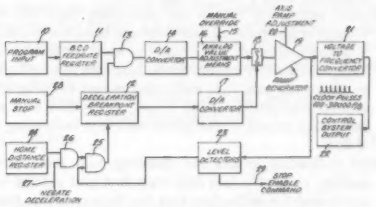
3,932,796
CONTROL SYSTEM FOR PRODUCING MULTI-AXIS CONTOUR MOVEMENT FOR A STEPPING MOTOR DRIVE

Marvin L. Kreithen, Huntingdon Valley, and John J. Lawler, Jr., Newportville, both of Pa., assignors to Textron, Inc., Providence, R.I.

Division of Ser. No. 224,752, Feb. 9, 1972, Pat. No. 3,767,990. This application Jan. 31, 1973, Ser. No. 328,285

Int. Cl.² G05B *19/40*

U.S. Cl. 318—685 **14 Claims**



1. In a system capable of movement of one part relative to another by relative movement of at least three series connected relatively movable members along a predetermined path and having step motors acting between said relatively movable parts to move said parts in discrete increments along a series of successive segments approximating said predetermined path, the improvement comprising a control circuit for generating a chain of pulses at variable frequencies for driving said step motors at variable speeds in accordance with system needs having:

pulse generator means in the form of a voltage to frequency convertor which responds to a voltage input through a voltage adjustment means for generating a train of pulses of variable frequency including means for varying the pulse frequency of pulses generated by said pulse generator means both above and below the slewing range of said step motors;

acceleration means for causing said pulse generator means to modify pulse frequency upon demand and particularly at the beginning of each segment exceeding a predetermined length to increase the pulse frequency from below slewing range into slewing range at a predetermined rate according to the inertial load on the step motors;

sensing means for sensing the number of steps remaining to be taken to the end of each such segment together with means for sensing the adjusted programmed feed-rate frequency and acting upon said acceleration means at some predetermined distance before the end of the segment to decrease pulse frequency to below the slewing range before the end of the segment, and

stop enable means to prevent stopping of step motors until voltage is decreased below a predetermined level representative of the slewing speed of the step motor including means to sense voltage at the voltage to frequency convertor input and employ this voltage against the standard of said predetermined level.

3,932,797

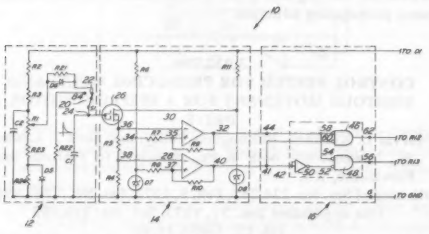
SELF-TESTING BATTERY DISCHARGE INDICATOR

Robert A. York, Mechanicsburg, Pa., assignor to Flight Systems, Inc., Mechanicsburg, Pa.

Filed Dec. 24, 1974, Ser. No. 536,134

Int. Cl.² G08B *21/00*; H02J *7/00*

U.S. Cl. 320—48 **35 Claims**



1. Apparatus for indicating the voltage of a battery and for disabling a load connected to the battery, comprising:

first indicating means for indicating that the battery voltage is greater than a first voltage level;

second indicating means for indicating that the battery voltage is less than said first voltage level but greater than a second voltage level, said second indicating means being electrically connected to said first indicating means so that when said first indicating means is energized said second energizing means is not, and when said second indicating means is energized said first indicating means is not;

third indicating means for disabling said load when the battery voltage is less than said first and second voltage levels and for indicating that the battery is less than said first and second voltage levels, said third indicating means being electrically connected to said first and second indicating means so that when either of said first and second indicating means are energized said third indicating means is not, and when said third indicating means is energized said first and second indicating means are not;

means for selectively energizing said first, second and third indicating means in response to first and second control signals;

means for sensing that the battery voltage is greater than said first voltage level, less than said first voltage level but greater than said second voltage level, and less than said first and second voltage levels and for generating said first and second control signals in response to a third control signal, said sensing means being electrically connected to said selectively energizing means; and

means for selectively generating said third control signal either at a fixed decay rate independent of the actual battery voltage or in response to the actual battery voltage, said generating means being electrically connected to said sensing means.

3,932,798

ELECTRICAL INVERTER CIRCUIT

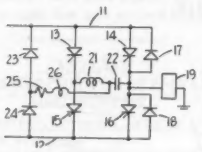
Brian John Chalmers, Bramhall, and John Philip Gibson, Longsight, both of England, assignors to C.A.V. Limited, Birmingham, England

Filed Dec. 5, 1974, Ser. No. 529,753

Claims priority, application United Kingdom, Dec. 22, 1973, 59680/73

Int. Cl.² H02M *7/515*

U.S. Cl. 321—45 C **4 Claims**



1. An electrical inverter comprising in combination positive and negative supply lines, first and second thyristors having their anodes connected to the positive line and their cathodes connected respectively to the anodes of third and fourth thyristors the cathodes of which are connected to the negative line, an oscillatory commutating circuit connected between the anodes of the third and fourth thyristors and comprising a capacitor and an inductor connected in series, a firing circuit providing gate signals to the first, fourth, third and second thyristors in that order, and means for over damping the oscillator circuit, comprising a resistor which effects a reduction in the voltage of the capacitor during the intervals between commutations, means for electrically connecting one end of said resistor to one or the other of said supply lines during the intervals between commutations, said last-mentioned means comprising a pair of diodes connected in series across said supply lines, the other end of said resistor being connected to a point intermediate said inductor and capacitor.

3,932,799

PEAK LOAD LEVELLING SYSTEM

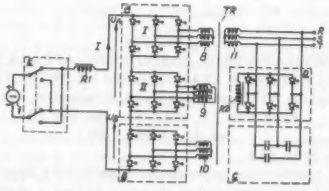
Kjell Frank, and Kjeld Thorborg, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Oct. 16, 1974, Ser. No. 515,358

Claims priority, application Sweden, Oct. 23, 1973, 73143505

Int. Cl.² H02M *7/00*

U.S. Cl. 321—27 R **3 Claims**



1. Load levelling system for connection to an alternating current network (RST), said system comprising electrochemical direct current energy supply means (1), line-commutated controllable electronic power convertor means (A, B) having DC terminals connected to said energy supply means and AC

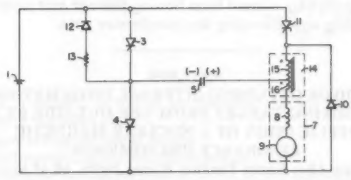
terminals for connection to said AC network, and continuously controllable reactive power generating means (C, D) connected to said AC terminals, said reactive power generating means comprising a fixed capacitor battery (C) and a line-commutated reactive power convertor (D), the convertor means comprising a first (A) and a second (B) line-commutated thyristor convertor connection, each convertor connection having DC and AC terminals, said convertor connections being series-connected through their DC terminals and having transformer means (TR) connecting their AC terminals, said first convertor connection (A) having a higher rated voltage than the second convertor connection (B), means for setting the control angle of said first convertor connection (A) to either one of two substantially fixed values, corresponding to full direct voltage in rectifying and in inverting operation, respectively, and means for controlling said second convertor connection (B) with a variable control angle.

3,932,800

DIRECT CURRENT POWER CONTROL CIRCUIT

Hideo Iwamoto, and Mamoru Miyamoto, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 10, 1975, Ser. No. 540,191
Claims priority, application Japan, Feb. 12, 1974, 49-17328
Int. Cl.² H02M *7/515*
U.S. Cl. 321—43 **6 Claims**



1. In apparatus operative with a direct current power source for supplying current through a predetermined power path to a load, the combination of:

reverse conducting controlled rectifier means for switching said load current from said source to said load in the forward direction;

a commutating thyristor and a capacitor in series connection thereto for commutating said rectifier means out of conduction;

a charging thyristor and a resistor in series connection thereto for initially charging said commutating capacitor from said source with a predetermined initial potential;

a saturable autotransformer having an unsaturated stated between two saturated states, said autotransformer including a first winding connected to said rectifier means, a second winding connected to said load, and a tap terminal common to said first and second windings and connected to said commutating capacitor with said first winding having more turns than said second winding;

said power path including said rectifier means and said first and second winding of said autotransformer in one of said saturated states; and

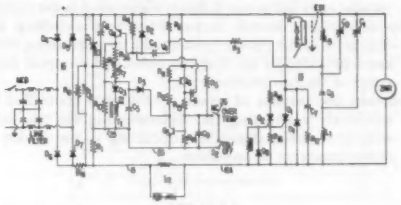
said commutating thyristor and capacitor being connected in parallel to said first winding and said rectifier means and being operative to apply a commutating voltage to said auto-transformer for changing the state thereof into said unsaturated state and for applying therethrough a reverse current to said rectifier means for terminating the conduction of said rectifier means.

3,932,801

INDUCTION COOKING UNIT HAVING ALL PAN SAFE OPERATION, WIDE RANGE POWER CONTROL AND LOW START-UP AND SHUT-DOWN TRANSIENTS

Philip H. Peters, Jr., Greenwich, N.Y., assignor to Environment/One Corporation, Schenectady, N.Y.

Division of Ser. No. 354,764, April 26, 1973, Pat. No. 3,886,342. This application Sept. 11, 1974, Ser. No. 505,133
Int. Cl.² H02M *7/505*
U.S. Cl. 321—45 C **12 Claims**



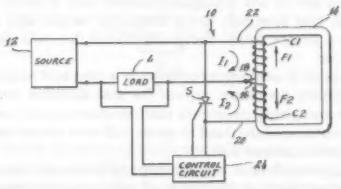
1. A chopper-inverter power supply comprising gate controlled thyristor means and commutation circuit means coupled in circuit relationship to and excited from a set of power supply terminals for connection to a source of excitation potential, gating circuit means coupled to and controlling turn-on of said gate controlled thyristor means and power control means for controlling the output power level of the chopper inverter power supply, said commutation circuit means comprising serially connected capacitor and inductor commutating reactive components connected in parallel circuit relationship across said gate controlled thyristor means and said power control means comprising a plurality of commutating element switching means for switching in different values of commutating capacitance in operating circuit relationship in the commutation circuit means, shunt capacitor means, and shunt capacitor switching means for switching certain one of ones of said commutating capacitor elements in shunt circuit relationship across at least a part of the inductor commutating reactive component at low power levels.

3,932,802

CONTROLLED POWER TRANSFERRING DEVICE AND METHOD UTILIZING A REACTANCE CONTROLLED BY DEVELOPMENT OF OPPOSING MAGNETIC FLUXES

Lionel B. Cornwell, 52 Madison Springs Drive, Madison, Conn. 06443

Filed July 12, 1974, Ser. No. 487,875
Int. Cl.² G05F *1/20*
U.S. Cl. 323—6 **14 Claims**



1. A power transferring device of the controlled reactance type used to regulate or control the transfer of alternating current electric power from a source to a load, characterized by:

reactance means including a reactive core and a first coil encircling the reactive core and arranged to be connected into a circuit in which the transfer of power is to be controlled, the reactive core and first coil presenting a reactance blocking the transfer of power in the circuit;

a second coil encircling the reactive core and being connected at one end to one end of the first coil;

controllable switch means for selectively connecting the other end of the first coil to the other end of the second coil to place the two coils in parallel;

the first and second coils being arranged on the reactive core so that when they are connected in parallel, the magnetic flux which is produced by a current in the second coil opposes and cancels the magnetic flux produced by the parallel current in the first coil, whereby a small amount of reactance is presented to the circuit by the two parallel coils and power is freely transferred in the circuit;

the controllable switch means selectively switching the reactance of the device between the large blocking reactance provided by the first coil alone and the small reactance of the two parallel coils;

whereby the transfer of power is efficiently controlled by selectively connecting and disconnecting the two coils with little power dissipation occurring in the device in either condition of operation.

3,932,803

ELECTRONIC MONITORING SYSTEM INCLUDING CONTACTLESS MOTION DETECTOR

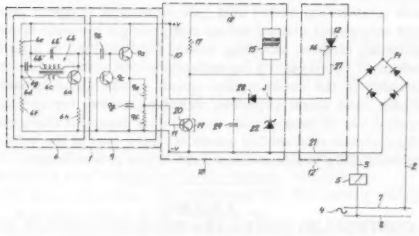
Robert Buck, Kirchbuhlweg 128, 7995 Neukirch, Germany

Filed June 12, 1974, Ser. No. 478,682

Claims priority, application Germany, June 14, 1973, 2330233

Int. Cl.² H01H *36/00*

U.S. Cl. 323—19 **25 Claims**



1. An electronic monitoring system comprising:

detector means sensitive to an ambient condition for generating an output signal varying with a change in said condition, said detector means being provided with a pair of power-input terminals;

a voltage-generating network including an electronic breakdown device and a constant-current unit in series therewith, said terminals being connected across said breakdown device in an energizing circuit for said detector means;

a source of direct current connected across said network for supplying operating current for said detector means to said energizing circuit via said constant-current unit;

a current-responsive load in series with said source and said constant-current unit;

a voltage-controlled variable-impedance means connected in shunt with at least part of said network across said source in series with said load; and

electronic control means coupled to said detector means and connected to said variable-impedance means for altering the conductivity thereof in response to changes in said output signal, thereby modifying the flow of current through said load with maintenance of a sufficient voltage drop across said breakdown device via said constant-current unit to keep said detector means operative regardless of changes in the conductivity of said variable-impedance means.

3,932,804

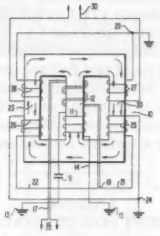
NEUTRALIZING TRANSFORMER ARRANGEMENT

Gordon Y. R. Allen, 4 Ireland Court, Islington, Ontario, Canada

Filed Jan. 7, 1974, Ser. No. 431,367

Int. Cl.² H04B *3/54*, *15/00*

U.S. Cl. 323—48 **12 Claims**



1. A neutralizing transformer arrangement for use in a power system comprising, in combination: a transformer core, a plurality of windings on said transformer core, one of said windings being a primary neutralizing winding which is to be connected between two spaced-apart points in the power system, and means for preventing saturation of said transformer core, which means include a D.C. blocking capacitor connected in series with said neutralizing winding for preventing a transient direct current component of an asymmetrical fault or switching current from flowing through said neutralizing winding and saturating the transformer core.

3,932,805

METHOD OF OBTAINING INTERNAL INFORMATION OF A MEASURING TARGET FROM THE OUT-SIDE BY THE APPLICATION OF A NUCLEAR MAGNETIC RESONANCE PHENOMENON

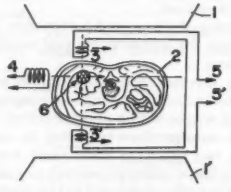
Zenuemon Abe; Kunio Tanaka; Masao Hotta, all of Sapporo, and Masaaki Imai, Iwamisawa, all of Japan, assignors to Kichizo Niwa, Sapporo, Japan

Filed Aug. 9, 1973, Ser. No. 387,138

Claims priority, application Japan, Feb. 2, 1973, 48-13508

Int. Cl.² G01R *33/08*

U.S. Cl. 324—.5 A **34 Claims**



1. A method of obtaining internal information of a specified area of a measuring target by use of a nuclear magnetic resonance phenomenon, including the steps of:

providing a homogeneous magnetic field H_0,

disposing the measuring target in said homogeneous magnetic field,

generating a scanning magnetic field ΔH_x and applying said scanning magnetic field ΔH_x in superimposed relationship with said homogeneous magnetic field H_0 to establish a level of field intensity in the specified area to be examined which differs substantially from the level of field intensity of the remaining portion of the measuring target,

providing a high-frequency magnetic field H . resonance frequency of a nuclear magnetic substance in the measuring target area, said high-frequency being determined by the level of field intensity in the said target area, and applying the high-frequency magnetic field in a direction perpendicular to the field H_0 so as to encompass at least said specified area of the measuring target and regions adjacent said specified area of said measuring target, to produce a signal representative of a nuclear magnetic substance in said specified area, and detecting and processing said signal for obtaining information of said nuclear magnetic substance of said specified area of said measuring target.

3,932,806

SURGE COMPARISON TYPE COIL TESTER

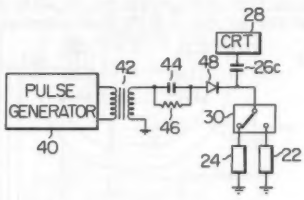
Tadao Kawada, 1356-7, Kawaguchi-cho, Hachioji, Tokyo, Japan

Filed Oct. 4, 1974, Ser. No. 512,288

Claims priority, application Japan, Nov. 14, 1973, 48-130704[U]

Int. Cl.² G01R *27/26*

U.S. Cl. 324—51 **11 Claims**



2. A method of testing an electrical coil for defects, comprising the steps of:

generating electrical pulses;

differentiating the electrical pulses;

applying the differentiated pulses to the electrical coil and also to a reference coil of identical specifications as the electrical coil, the reference coil being free from defects, to produce surges of electrical current through the electrical coil and reference coil; and

comparing the waveforms of the current through the electrical coil and reference coil, the electrical coil being judged free from defects if the current waveforms are substantially identical and defective if the current waveforms substantially differ from each other.

3,932,807

GAS SENSITIVE DEVICES

Ronald Wilson, Calver, England, assignor to National Research Development Corporation, London, England

Filed Mar. 29, 1974, Ser. No. 456,217

Claims priority, application United Kingdom, Mar. 30, 1973, 15576/73

Int. Cl.² G01N *27/00*; G08B *21/00*; G01N *31/00*

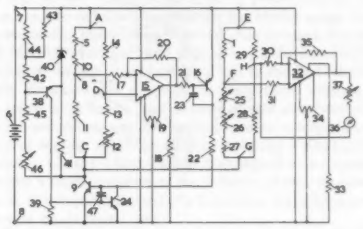
U.S. Cl. 324—71 SN **3 Claims**

1. A gas detection system comprising:

a gas-sensitive resistor consisting of semiconducting material exposed for contact with an atmosphere under test;

a bridge circuit in one arm of which is connected an electric resistance heater having an appreciable temperature coefficient of resistance, said heater being closely juxtaposed with the gas-sensitive resistor and being operable to heat the gas-sensitive resistor to temperatures at which the electrical conductivity of the semiconducting material is dependent on the concentration of a particular gaseous substance in an atmosphere to which said material is exposed;

means for enabling current to be supplied to said bridge circuit via a pair of input terminals of the bridge circuit, said bridge circuit having a pair of output terminals between which a voltage appears when current is supplied to the bridge circuit via said input terminals with the bridge circuit unbalanced;



means operative in response to variations in said voltage for automatically controlling the current supplied to said bridge circuit via said input terminals so that in normal operation the resistance of said heater is maintained substantially constant at a value corresponding to a desired operating temperature of said gas-sensitive resistor; and

detecting means responsive to changes in the resistance of said gas-sensitive resistor.

3,932,808

POWER FACTOR CORRECTING MEANS

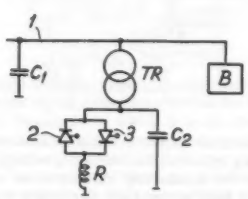
Kjell Frank, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Nov. 21, 1974, Ser. No. 526,069

Claims priority, application Sweden, Dec. 13, 1973, 7316835

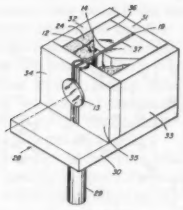
Int. Cl.² G05F *1/68*

U.S. Cl. 323—102 **4 Claims**



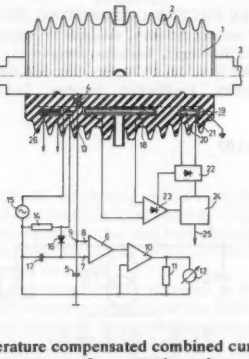
1. Power factor correcting means for connection to an AC voltage network (1) comprising a transformer (TR) with high-voltage terminals for connection to the network and low-voltage terminals, a capacitor battery (C_1, C_2) for connection to the network, and a controllable inductive element (R, 2,3) connected to the low-voltage terminal of the transformer, in which the capacitor battery comprises a first part (C_1) connected to the high-voltage terminal of the transformer and a second part (C_2) connected to the low-voltage terminal of the transformer, and in which the rated power of the second portion (C_2) of the capacitor battery is between 0.3 and 0.7 times as great as the maximum reactive power of the inductive element.

3,932,809
DEFLECTOR GALVANOMETER
Lee F. Frank, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed May 28, 1974, Ser. No. 473,635
Int. Cl.² G01R 31/00
U.S. Cl. 324—96 **7 Claims**



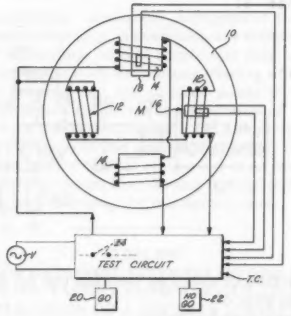
6. The galvanometer in accordance with claim 5 wherein the damping means is a diluted solution of silicone rubber.

3,932,810
TEMPERATURE COMPENSATED COMBINED CURRENT AND VOLTAGE MEASURING APPARATUS
Werner Kohler, Bentfeld, Holstein, and Norbert Steinemer, Berlin, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Nov. 29, 1974, Ser. No. 528,490
Claims priority, application Germany, Dec. 20, 1973, 2363932
Int. Cl.² G01R 15/04, 15/00
U.S. Cl. 324—126 **8 Claims**



1. A temperature compensated combined current and voltage measuring apparatus for measuring voltage and current on a conductor for conducting current at an upper potential comprising: a body of cast resin disposed in surrounding relation to the conductor; current measuring means carried by said body of cast resin for sensing the current in the conductor; a capacitive voltage divider having upper and lower potential capacitors and extending between the upper potential and a lower potential; said upper potential capacitor being arranged with respect to said cast resin body as to cause said cast resin to be the dielectric thereof; and, a temperature compensating arrangement including: an auxiliary capacitor embedded in the cast resin body and having a dielectric subjected to the same temperature changes as the dielectric of said upper potential capacitor whereby the capacitance of said auxiliary capacitor changes in the same manner as the capacitance of said upper potential capacitor; a resistor serially connected to said auxiliary capacitor; a generator connected across the serial combination of said auxiliary capacitor and said resistor thereby causing a voltage to drop across said resistor having magnitude indicative of the capacitance of said auxiliary capacitor; rectifying and smoothing means for rectifying and smoothing said voltage; and, a differential amplifier having first and second inputs, said first input being connected to receive the smoothed rectified voltage dropped across said resistor, and said second input being connected to said capacitive voltage divider at the terminal of said low-voltage capacitor away from said lower potential whereby a change in the divider ratio of said capacitive voltage divider caused by changes in the temperature of said upper potential capacitor is compensated.

3,932,811
METHOD AND APPARATUS FOR TESTING WINDINGS OR THE LIKE
Robert L. Branch, Brecksville, Ohio, assignor to Avtron Manufacturing, Inc., Cleveland, Ohio
Filed Feb. 22, 1972, Ser. No. 228,184
Int. Cl.² G01R 31/06; H02K 15/00
U.S. Cl. 324—158 MG **21 Claims**

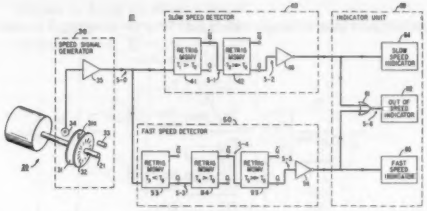


1. A method of testing motor stator windings prior to final motor assembly for proper winding connections of at least first and second windings to obtain a given motor direction and comprising the steps of applying alternating voltage to said windings to respectively produce first and second magnetic fields, electrically sensing each of said magnetic fields and electrically determining whether each field has a first phase relationship or a second phase relationship with respect to said alternating voltage and independently of the relative magnitudes of said fields and said alternating voltage, and providing an output indication of whether the winding connections are proper or not dependent upon said phase relationships.

3,932,812
MOTOR SPEED INDICATOR
Lee J. Milligan, Fairfield, N.J., assignor to Peripheral Equipment Corporation, Fairfield, N.J.
Filed Mar. 20, 1974, Ser. No. 452,754
Int. Cl.² G01P 3/56
U.S. Cl. 324—161 **8 Claims**

1. Apparatus for indicating whether a motor is operating out of speed, comprising:
a slow speed detector;
a high speed detector; and
an indicator unit;
said slow speed detector including a first retriggerable multivibrator having a time period greater than the desired operating speed, and a second retriggerable multivibrator having a time period greater than that of said first multivibrator to provide a slow speed indicator signal for said indicator unit; and said high speed detector including a third retriggerable multivibrator having a time period less than said desired operating speed, a fourth retriggerable multivibrator coupled to said third

multivibrator and having a time period greater than said desired operating speed, and a fifth multivibrator coupled to said



fourth multivibrator and having a time period greater than that of said fourth multivibrator to provide a high speed indicator signal for said indicator unit.

3,932,813

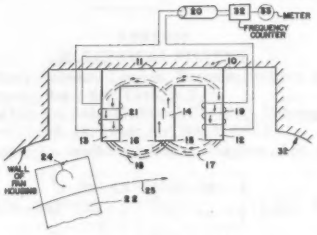
EDDY CURRENT SENSOR

George A. Gallant, Burlington, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Continuation of Ser. No. 245,863, April 20, 1972, abandoned. This application Mar. 28, 1974, Ser. No. 455,742

Int. Cl.[2] G01P *3/46*

U.S. Cl. 324—164 **4 Claims**



1. An eddy current sensing arrangement for developing a representation of velocity of a turbine engine by sensing eddy currents, which arrangement is substantially insensitive to common mode noise voltages due to stray fields, vibrations, shocks and the like, comprising, in combination:

a. a plurality of fan blades of said turbine engine made from non-magnetic, conductive material,

b. a magnetic core having an integrated back plate and a pair of outer legs offstanding in a plane normal to said back plate, each of said outer legs having a respective longitudinal axis,

c. a central leg having a longitudinal axis and including magnet means interposed between and spaced from said outer legs, to thereby provide an air gap between said central leg and respective ones of said outer legs, said central leg establishing a magnetic flux clockwise through one leg of said outer legs and counter-clockwise through other leg of said outer legs,

d. a first winding wound about one of said outer legs and a second winding wound about the other of said outer legs, said windings have respective winding axes and being connected in series, such that magnetic flux changes passing in opposite directions parallel to said winding axes through said first and second windings induce voltages in said first and second windings which reinforcingly add, and flux changes passing in the same direction parallel to the axes of said windings and through said windings induce voltages in the first and second windings which cancel, and

e. means for rotatably mounting said plurality of fan blades made from non-magnetic, conductive material about an axis substantially perpendicular to a plane containing said longitudinal axis of said central legs for passage one after another in close proximity to said legs, each of said fan blades passing in close proximity to a first one of said outer legs, said central leg and the other of said outer legs in that order,

f. said windings further including leads and an output cable, said legs of said magnetic core being positioned so that when any one of said non-magnetic fan blades made from non-magnetic, conductive material pass through the flux field of the first air gap, and then through the flux field of the second air gap, it induces a voltage in the first winding in one direction and a voltage in the second winding in the opposite direction, and as each of said members pass into the second air gap it induces a reverse voltage in said first and second windings thereby creating a discernible change in voltage which can be transmitted to a counter, whereby a representation of the velocity of said members may be developed substantially free from the influence of common mode noise, and

g. a fan housing of said turbine engine having a wall wherein said magnetic core is mounted.

3,932,814

HETERODYNE RECEIVER SYSTEM

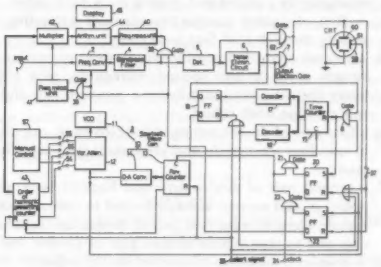
Shoji Niki, Gyoda, Japan, assignor to Takeda Riken Kogyo Kabushikikaisha, Tokyo, Japan

Filed May 20, 1974, Ser. No. 471,635

Claims priority, application Japan, May 28, 1973, 48-59980

Int. Cl.[2] H04B *1/36*

U.S. Cl. 325—332 **22 Claims**



1. A heterodyne receiver system for determining the frequency of an input signal, comprising means for receiving an input signal the frequency of which is to be determined, a frequency swept local oscillator for generating a local oscillator signal and harmonics thereof, a frequency converter responsive to said local oscillator signal and to said input signal and operative to provide a frequency mixing of the input signal frequency with the local oscillator signal frequency and its harmonic frequency, an intermediate frequency filter coupled to said converter for passing those outputs of the frequency converter which are of a predetermined intermediate frequency, an intermediate frequency detector coupled to said filter for detecting the occurrence of signals at said intermediate frequency, said filter producing a pair of time spaced signals at said intermediate frequency at different times in response to a same input signal and for a given order of harmonics of the local oscillator signal, means for extracting one signal of said pair of signals, which occurs at a given time interval after a first occurring one of said intermediate frequency signals thereby to elect said one of said pair of intermediate frequency signals which occurs later in time, and means response to the occurrence of said elected signal within

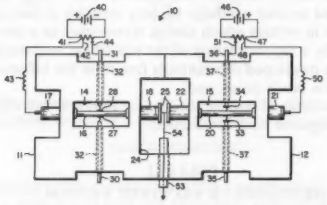
said given time interval for determining the frequency of said input signal.

3,932,815

BROADBAND WAVEGUIDE MIXER

Lloyd T. Yuan, Hacienda Heights, and Jack S. Honda, Palos Verdes, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Mar. 21, 1975, Ser. No. 560,917
Int. Cl.² H04B *1/26*
U.S. Cl. 325—445 **11 Claims**



1. A broadband waveguide mixer suitable for use in the microwave and millimeter wave regions comprising:

a. a first waveguide;

b. a second waveguide, said waveguides being disposed substantially parallel and spaced from each other;

c. a first elongated conductive element extending transversely through said first waveguide;

d. a second elongated conductive element extending transversely through said second waveguide, said elements being disposed substantially on a common axis and being spaced from each other;

e. a first pair of diodes arranged back-to-back and disposed in said first waveguide and in contact with said first element;

f. a second pair of diodes arranged back-to-back and disposed in said second waveguide and in contact with said second element, said first pair of diodes having a polarity opposite to that of said second pair of diodes; and

g. a coaxial conductor connected to the adjacent ends of said elements, whereby when a first wave is impressed on said first waveguide and a second wave of different frequency is impressed on said second waveguide, the difference frequency wave is derived from said coaxial conductor.

3,932,816

MULTIFREQUENCY DRIVE CLOCK

William W. MacGregor, Wellesley Hills, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Dec. 13, 1974, Ser. No. 532,670
Int. Cl.² H03K *1/17*; H03B *5/36*
U.S. Cl. 328—61 **8 Claims**

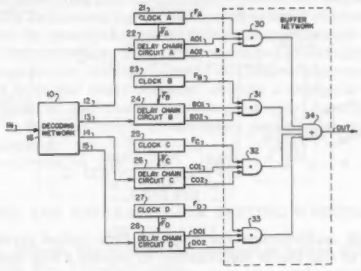
5. Apparatus for generating one of a plurality of clock drive frequencies comprising:

a plurality of clock circuits,

a plurality of input terminals for receiving mutually exclusive control signals,

logical means coupled to said clock circuits and responsive to delayed control signals for selectively passing signals from one of said clock circuits to an apparatus output terminal; and

a plurality of delay means each coupled to a respective one of said input terminals and responsive to signals from one of said clock circuits, said delaying means coupled to said



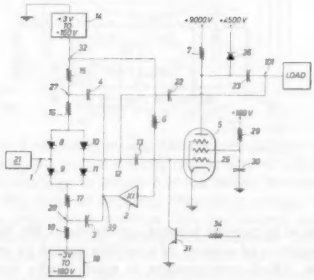
logical means for sending said delayed control signals to said logical means.

3,932,817

HIGH VOLTAGE TRIANGULAR WAVEFORM GENERATOR

Edwin J. Rogers, P. O. Box 3136, Austin, Tex. 78764

Filed Mar. 28, 1974, Ser. No. 455,644
Int. Cl.² G06G *7/18*; H03K *4/10*
U.S. Cl. 328—128 **10 Claims**



1. A triangular waveform generator circuit suitable for driving a deflection plate load, comprising:

an amplifying device having an output electrode and a control electrode;

a two-level current source;

first capacitive coupling means connected between said current source and the control electrode of said amplifying device;

second capacitive coupling means connected between the output electrode of said amplifying device and the load;

an integrating capacitor connected between said current source and the load; and

means connected to the control electrode of said amplifying device for automatically establishing and maintaining the operating point of said amplifying device.

3,932,818

SPECTRUM NOTCHER

Raymond J. Masak, East Northport, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

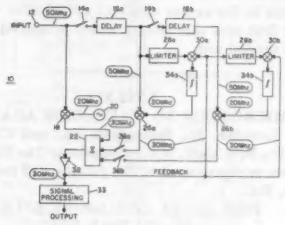
Filed July 18, 1974, Ser. No. 489,623
Int. Cl.² H04B *15/00*
U.S. Cl. 328—167 **8 Claims**

1. An adaptive filter for suppressing an interfering narrow-

band signal in a composite signal containing a desired broadband signal, comprising:

means, responsive to supplied signals, for combining said signals to form an output signal;

means for supplying said composite signal to said combining means;



means, responsive to said composite signal, for providing a delayed replica of said composite signal;

and means, jointly responsive to said delayed replica and to said output signal, for developing a correction signal and for supplying said correction signal to said combining means to cause suppression of said interfering narrowband signal in said output signal.

3,932,819
ELECTRICAL FILTERS

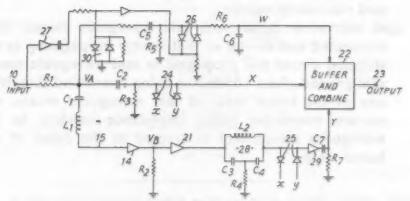
Paul Anthony Spencer, London, England, assignor to Dolby Laboratories, Inc., New York, N.Y.

Division of Ser. No. 346,629, March 30, 1973. This application Oct. 18, 1974, Ser. No. 515,843

Claims priority, application United Kingdom, Apr. 4, 1972, 15485/72

Int. Cl.² H04B *1/04*

U.S. Cl. 328—167 **7 Claims**



7. A circuit for modifying the dynamic range of a signal, comprising a main signal path arranged to transmit a main signal component with dynamic range linearity from an input terminal to an output terminal, a further signal path having an input connected to a point in the main path and an output for providing a further signal component limited above a limiting threshold by limiting means in the further path, and means for combining the further signal component with the main signal component so as either to boost or buck the main signal component, wherein the further signal path includes a trap circuit for rejecting a carrier frequency, the trap circuit comprising two capacitors in series in a series arm, an inductor bridging the two capacitors, and a resistive shunt arm connected to the junction of the two capacitors and providing a resistance value such that the signal passed by the trap circuit at the tuned frequency thereof is substantially nil.

3,932,820
CROSSED FIELD AMPLIFIERS

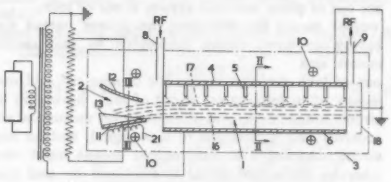
Lionel Damon, and Brian Philip Scoffield, both of Malvern, England, assignors to The British Secretary of State for Defense, London, England

Filed July 8, 1974, Ser. No. 486,740

Claims priority, application United Kingdom, July 6, 1973, 32202/73

Int. Cl.² H03F *3/58*

U.S. Cl. 330—43 **6 Claims**



1. A crossed field amplifier comprising two spaced electrodes means for applying a first electric potential field between said two electrodes, a radio frequency signal input for feeding input signals between said two electrodes at one end thereof, a radio frequency signal output for collecting the signal from between the electrodes, a cathode and anode disposed in spaced relation to one another adjacent one end of said two spaced electrodes, means for applying a second electric potential field between said cathode and anode to cause the cathode to emit electrons from a surface thereof, an evacuated envelope containing the two electrodes, the cathode, and the anode, a magnetic field system for producing a uniform magnetic field perpendicular to each of said first and second electric potential fields, whereby electrons emitted from the cathode are caused to travel between the two electrodes perpendicular to said magnetic field to interact with the radio frequency signals and provide amplification thereof, said magnetic field system including means for producing a non-uniform magnetic field component normal to said electron emitting surface of said cathode which component varies across said cathode surface whereby noise in the radio frequency signal output is reduced.

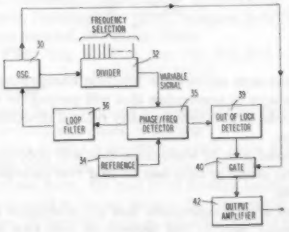
3,932,821
OUT OF LOCK DETECTOR FOR PHASE LOCK LOOP SYNTHESIZER

Boyd M. McClaskey, Flourtown, Pa., assignor to Narco Scientific Industries, Inc., Fort Washington, Pa.

Filed Nov. 8, 1974, Ser. No. 522,053

Int. Cl.² H03B *3/04*

U.S. Cl. 331—25 **9 Claims**



1. A radio synthesizer system for generating a plurality of selectable radio frequency signals, comprising:

a. oscillator means for generating a periodic signal, being tunable such that the frequency of said periodic signal can be varied as a function of a tuning signal;

b. divider means for dividing the frequency of said periodic signal, said divider means having selecting means for determining the selected system frequency;

c. frequency reference means, for generating a reference signal of a predetermined frequency and phase;

d. phase detector means, connected to said oscillator means, for comparing said divider signal and said reference signal and producing said tuning signal as a function of the comparative phase of said signals, said phase detector means also being characterized by producing a pulsed out of lock signal when said divider and reference signals are out of phase and said system is out of lock;

e. output means for providing the system output signal, having an input circuit connected to said oscillator means; and

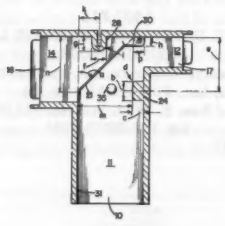
f. out of lock detector means for turning off said output means when said system is out of lock, having an input circuit connected to said phase detector means and which receives said pulsed out of lock signal, and an output circuit connected to said output means input circuit, whereby no output signal is produced by said system when it is out of lock.

5. In a phase lock loop system for generating a pulse signal at a given frequency, apparatus for generating a DC signal representative of when said system is in lock and when out of lock, comprising detector means for comparing a loop signal with a reference signal and producing pulses as long as said system is out of lock, and means for generating a DC signal having a polarity which is a function of whether said system is in lock, said DC signal means having a non-linear circuit connecting to said detector means for receiving said out of lock pulses, wherein said DC signal generating means comprises a capacitor in combination with a voltage source of a first polarity, said capacitor normally being charged through said source with said first polarity, and wherein said non-linear circuit comprises at least one diode.

3,932,822
BROAD BAND ORTHOGONAL MODE JUNCTION

Edward Salzberg, 19 Black Oak Road, Wayland, Mass. 01778

Filed Jan. 30, 1975, Ser. No. 545,711
Int. Cl.² H01P *1/16, 5/12*
U.S. Cl. 333—9 **7 Claims**



1. A three-arm microwave junction comprising:

a. a first arm of waveguide that will propagate a fundamental mode in two orthogonally related directions of polarization;

b. a second arm of waveguide that will propagate a fundamental mode in only one of said two directions of polarization,

c. a third arm of waveguide that will propagate a fundamental mode only in the second of said two directions of polarization;

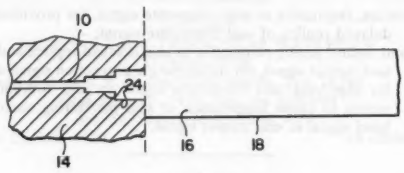
d. a junction region joining said first, second and third waveguide arms together so that energy in a first of said two orthogonally related directions of polarization will couple between said second arm and said first arm only and energy in the second of said two orthogonally related directions of polarization will couple between said third arm and said first arm only; and,

e. matching structure in said junction region comprising a protruding ridge across a narrow wall proximate said third arm, a step structure protruding from a broad wall coextensive with said narrow wall and proximate said second arm, said step structure extending into slanting junctures joining said second and third arms along a diagonal within said junction region, and a protruding button in the center of a wall coextensive with a wall of said first arm said button being in spaced proximity to said second arm.

3,932,823
MICROSTRIP TO WAVEGUIDE ADAPTER

Louis J. Lavedan, Jr., Springfield, Va., and Carlton S. Collings, Jr., New York, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 23, 1975, Ser. No. 571,039
Int. Cl.² H01P *1/16*
U.S. Cl. 333—21 R **3 Claims**



3. A waveguide to microstrip adapter for permitting the insertion of waveguide circuit components in a microstrip system comprising:

microstrip means with one, wide, ground-plane conductor and a strip conductor of narrow width relative to said ground-plane conductor laying on a supporting medium above said ground plane conductor; and

waveguide means with at least two broad walls and having a small size relative to said microstrip means, said waveguide means being heavily loaded dielectrically so that it can propagate the R.F. energy that is being propagated by said microstrip means;

said microstrip means and said waveguide means being connected end-to-end so that energy propagating in said stripline means will propagate in said waveguide means, said ground-plane conductor being connected directly to one of the broad walls of said waveguide means, said narrow conductor being impedance-matched to said waveguide means and connected to the other of said broad walls.

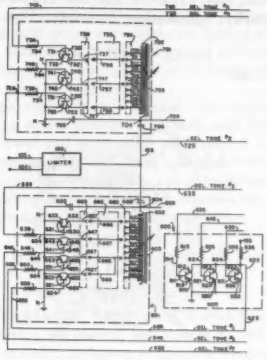
3,932,824
SIGNAL SELECTIVE CIRCUIT

Keith H. Wycoff, P.O. Box 308, Lexington, Nebr. 68850

Continuation of Ser. No. 17,233, March 6, 1970, abandoned, which is a division of Ser. No. 666,645, Sept. 11, 1967, Pat. No. 3,597,690. This application Oct. 17, 1974, Ser. No. 515,505
Int. Cl.² H03H *7/10*
U.S. Cl. 333—70 R **13 Claims**

1. A sequential-signal selective circuit for use in a communication system and comprising a signal responsive circuit having a plurality of terminals for varying the response characteristics of the signal responsive circuit, a first connector having a plurality of terminals fixedly coupled respectively to the terminals of said signal responsive circuit, a second connector having terminals matable with the terminals of said first connector, means associated with said second connector for substantially permanently interconnecting selected ones of the terminals thereof, said means being selectively arrangeable to interconnect selected terminals of said second connector and

thereby interconnect corresponding terminals of said signal responsive circuit to establish the response characteristics thereof, and output circuit means coupled to said signal responsive circuit and responsive to a signal therefrom to produce a control signal, said signal responsive circuit having control input means for receiving a control signal to change the response characteristics of said signal responsive circuit in accordance with the arrangement of said interconnecting means.

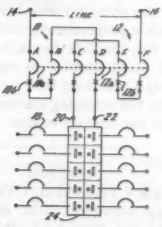


3,932,825

CURRENT LIMITING CIRCUIT BREAKER SYSTEM

John De Torre, Albemarle, N.C., assignor to Federal Pacific Electric Company, Newark, N.J.

Filed Apr. 9, 1974, Ser. No. 459,321
Int. Cl.[2] H01H 77/02
U.S. Cl. 335—8 15 Claims



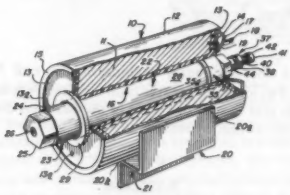
1. A circuit interrupter for a three-wire single phase, 240-volt alternating current supply comprising first and second line terminals and a neutral and having an available current greatly in excess of 10,000 amperes, said interrupter including a plurality of pole units of the molded case air breaker class, each pole unit having at least a movable contact and a companion contact engaged thereby and each pole unit having a molded case of insulation containing said contacts and providing enclosed arcing space for the contacts thereof two of such pole units where arranged as a two-pole breaker having an interruption capacity of 5,000 Amps at 240 volts A.C., operating means for said movable contacts of said plurality of pole units, a first half of said plurality of pole units being connected in series in a first circuit for interposition between the first line terminal and a first load terminal and a second half of said plurality of pole units being connected in series in a second circuit for interposition between the second line terminal and a second load terminal, means for effecting coordinated release of said operating means in response to a fault and for effecting coordinated opening operation of the movable contacts of all said pole units, said release means including at least one overcurrent sensing device in each of said first and second series circuits, said coordinated pole units limiting the rise of fault current and driving the fault current to zero without dependence on the A.C. source voltage decreasing to zero.

3,932,826

DASHPOT SOLENOID

Reginald A. Read, Jr., 3713 Grand Blvd., Brookfield, Ill. 60513

Division of Ser. No. 402,477, Oct. 1, 1973, Pat. No. 3,852,871.
This application Aug. 22, 1974, Ser. No. 499,470
Int. Cl.[2] H01F 7/16
U.S. Cl. 335—240 10 Claims



1. An air damped solenoid dashpot assembly for mounting within the coil of a solenoid comprising a thin-walled tubular member, the inner surface of which defines a cylindrical bore, a cylindrical plunger of a predetermined diameter extending into said tubular member through one end thereof for serving as an armature of such a solenoid, said plunger being reciprocable in said bore and effectively closing said end, a reinforcing member circumscribing said tubular member adjacent said end thereof and in circumannular compressive engagement with the external surface of the circumscribed portion of said tubular member, said reinforcing member supporting the wall of said tubular member and maintaining said bore within said portion in a cylindrical configuration of an accurate predetermined diameter, said portion of said tubular member thereby being maintained in effectively fluid-tight sliding annular sealing engagement with the outer cylindrical surface of said plunger during such reciprocating movement of said plunger, a closure member closing the other end of said tubular member, and means for metering passage of air through said closure member, whereby a substantially air-tight damping chamber is provided within said bore between said plunger and said closure member during such reciprocating movement.

3,932,827

MAGNETIC FIELD DRIVE COILS FOR FIELD ACCESSED CYLINDRICAL DOMAIN MEMORIES

Carl F. Buhrer, Framingham, Mass., assignor to GTE Laboratories, Incorporated, Waltham, Mass.

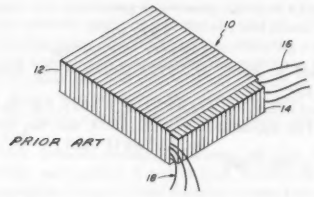
Filed Aug. 5, 1974, Ser. No. 494,591
Int. Cl.[2] H01F 27/30
U.S. Cl. 336—60 8 Claims

1. A magnetic field drive coil arrangement for field accessed cylindrical domain memories, including:

a. a coil form having a length to width ratio greater than unity and an access opening formed in each end of the length of the form, the coil form further having a central region adapted to house therein the cylindrical magnetic memories, peripherial regions on either side of the central region and a longitudinal axis extending along the length of the form to each of the access openings,

b. a first field drive coil diaposed around the coil form at the central region and a portion of the peripheral regions, and the portions of the turns of the first coil within the central region being parallel to the longitudinal axis,

c. a second field drive coil disposed around the central region and overlapping the first coil, the turns of the two coils in the central region being perpendicular to each other, the portion of the turns of the first coil disposed

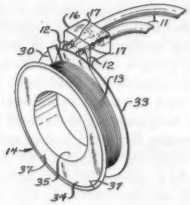


around the peripheral regions of the coil form being aligned at an angle greater than zero degrees to the longitudinal axis so that the turns of the first coil diverge away from the access openings.

3,932,828
ENCAPSULATED COIL AND METHOD OF MAKING THE SAME

James P. Plunkett, West Dundee, Ill., and Joseph T. Latchford, Bowmanville, Canada, assignors to Coils, Inc., Huntley, Ill.

Continuation of Ser. No. 408,766, Oct. 23, 1973, abandoned. This application Aug. 5, 1974, Ser. No. 495,034
Int. Cl.² H01F 15/10
U.S. Cl. 336—96 **5 Claims**

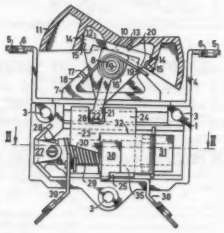


1. A coil assembly including a bobbin and a coil of wire thereon; the bobbin comprising a one-piece molding of plastic insulating material having parallel annular flanges extending radially outwardly from a sleeve-like portion jointly forming a spool on which the coil is wound between the flanges, and a terminal block extending outwardly in an axial direction from the peripheral portion of one of the flanges with a pair of terminal-receiving stepped apertures each having a reduced diameter portion adjacent said flange and an enlarged diameter portion on an opposite end of said block; a tubular terminal having an enlarged head at one end received in said enlarged diameter portion and extending through said reduced-diameter portion of each aperture into the zone in planar relationship with the coil; each terminal having a tongue cut backwardly from an opposite end of the tubular portion thereof and folded back and receiving a coil end; a lead wire extending into each terminal with its insulation extending into the larger-diameter portion of the aperture receiving that terminal and adhered to the wall of said aperture, each terminal being inwardly crimped to secure the lead wire therein and make good contact with the lead wire.

3,932,829
EXCESS CURRENT SWITCH

Jakob Ellenberger, Altdorf near Nurnberg, Germany, assignor to Ellenberger & Poensgen GmbH, Altdorf near Nurnberg, Germany

Filed Oct. 11, 1974, Ser. No. 514,281
Claims priority, application Germany, Oct. 25, 1973, 2353415
Int. Cl.² H01H 71/16
U.S. Cl. 337—49 **8 Claims**

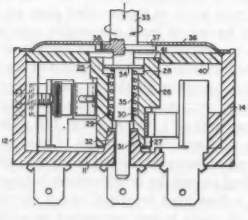


1. An excess current switch comprising a housing, a contact bridge, a bimetal strip for providing a thermal trip, switch actuating means movable between an ON position and an OFF position, spring means and a slide bar, the bimetal strip including a retaining member and a stop, the retaining member being arranged for retaining the contact bridge in a first position which represents the switched ON condition of the switch, the slide bar being adapted to be guided in the housing and supporting the spring means which biases the contact bridge so that when the contact bridge is released by the retaining member it is moved under the bias of the spring to a second position which represents the switched OFF condition of the switch, the contact bridge including a stop, said stop being adapted to be engaged by the slide bar and brought into engagement with the retaining member of the bimetal strip during a switching ON operation, the actuating means being coupled to the slide bar and being pivotally mounted about an axis which is perpendicular to the direction of movement of the slide bar, the slide bar including a protuberance, said protuberance being adapted to engage said stop on the bimetal strip during a switching OFF movement of the actuating means whereby the retaining member of the bimetal strip is disengaged from the contact bridge.

3,932,830
PUSH-TO-TURN THERMAL CYCLING SWITCH

Calvin J. Holtkamp, Mansfield, Ohio, assignor to White-Westinghouse Corporation, Cleveland, Ohio

Filed Jan. 23, 1975, Ser. No. 543,375
Int. Cl.² H01H 71/16
U.S. Cl. 337—64 **6 Claims**



1. In a thermal cycling switch including a casing with a base wall having an exteriorly tapered collar with a central bore, a

cover opposite the base wall, a bimetal assembly carrying one switch contact and a spring arm carrying an opposite switch contact movable toward and away from the bimetal assembly, a switch controlling arrangement comprising:

a rotatable shaft having its lower end journaled in said base wall and its upper end projecting out of said cover;

a hollow cam having circumferential cam faces thereon for adjusting said spring arm, said cam having a bore receiving said shaft therethrough in axially shiftable relation;

means at the upper end of said bore fixing said shaft and cam for rotation together;

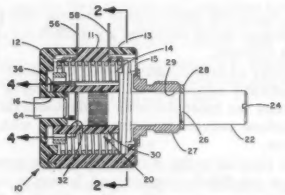
compression spring means in said bore urging said shaft toward an upper position and said cam downwardly to seat its lower end portion on said tapered collar; and

detent means locking said shaft against rotation when said shaft is in said upper position and permitting said rotation upon shifting said shaft axially downwardly a predetermined amount.

3,932,831
VARIABLE RESISTANCE DEVICE

Ronald A. Shirley, La Habra, and Robert J. DeLong, Temple City, both of Calif., assignors to Spectrol Electronics Corporation, Industry, Calif.

Filed June 25, 1974, Ser. No. 482,938
Int. Cl.² H01C *10/24*
U.S. Cl. 338—143 **10 Claims**



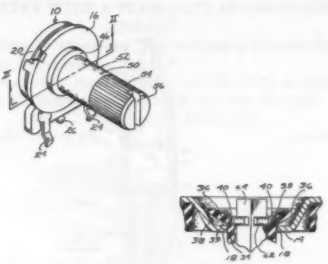
1. In a variable resistor including a resistance element, a housing supporting the resistance element, a rotary assembly including shaft means located within said housing, contact means carried by said rotary assembly and being adaptable to slidably engage the resistance element in response to rotary movement of said assembly, and electrical conductor means supported by said housing in engagement with spaced positions on said resistance element, the improvement comprising:

means to restrain rotational movement of said rotary assembly except upon application of a relatively large magnitude predetermined force to said assembly, said restraining means including resilient means disposed radially inward of said rotary assembly and a member having first and second operating positions, said member when in said first operating position being spaced apart from said resilient means to permit substantially free rotation of said assembly, and when in said second operating position being in engagement with said resilient means to expand said resilient means radially outward to develop a relatively large magnitude frictional force between opposed surfaces of said resilient means, said rotary assembly and said member whereby the magnitude of said frictional force determines the magnitude of said predetermined force.

3,932,832
PLUG-IN SHAFT FOR ELECTRICAL CONTROL

John D. Van Benthuysen, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed Mar. 18, 1974, Ser. No. 452,126
Int. Cl.² H01C *10/34*
U.S. Cl. 338—166 **6 Claims**



1. A variable resistance control comprising a resistance element and a collector in spaced relationship, a rotatable member, a hub integral with the rotatable member and containing an abuttment member, the rotatable member and hub being provided with a noncircular opening, the edge of the hub engaging one of the collector and the resistance element, the abuttment member being provided with a dish shaped surface circularly disposed about the opening, a contactor constrained to rotate with the rotatable member for wiping contact with the collector and the resistance element, a shaft secured to the rotatable member, said shaft comprising a shoulder, a noncircular first shaft portion disposed within the opening and connected to the shoulder, and a noncircular second shaft portion contiguous with the first shaft portion, said first and second shaft portions having substantially the same surfaces conforming to said opening, and a plurality of discrete nubbins supported on said first shaft portion and engaging said abuttment member, said nubbins projecting from said surface of said first shaft portion whereby the second shaft portion prealigns the shaft upright and rigidly within the noncircular opening, said nubbins resiliently engaging the dish shaped surface and providing outward radial pressure on the hub.

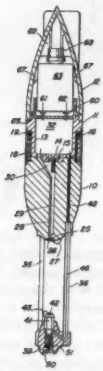
3,932,833
INSTRUMENT FOR DIRECT MEASUREMENT OF THE VELOCITY OF SOUND IN A FLUID

Frank Massa, and Donald P. Massa, both of Cohasset, Mass., assignors to Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees of the Stoneleigh Trust u/d/t Dec. 4, 1973, Cohasset, Mass.

Continuation-in-part of Ser. No. 790,965, Jan. 14, 1969, Pat. No. 3,561,268, and a continuation-in-part of Ser. No. 798,310, Feb. 11, 1969, Pat. No. 3,611,276. This application Apr. 22, 1970, Ser. No. 30,631
Int. Cl.² G01H *5/00*
U.S. Cl. 340—5 S **5 Claims**

1. A velocimeter for directly measuring the velocity of sound in a body of water, said velocimeter comprising a structure having a streamlined shape with a weighted streamlined nose section having a circular base, a transducer means comprising a piezoelectric ceramic cylinder coaxially mounted on said circular base, low acoustic impedance insulation means interposed between the end surface of said ceramic cylinder and said base of said nose section, a cup-shaped member with an extended flange section at its open end, said cup member having a body diameter smaller than the inside diameter of said ceramic cylinder and an outer flange diameter substantially equal to the main body diameter of said nose section, means for rigidly fastening said cup-shaped member to the base of said nose section whereby said cup-shaped member and flange serve as a nest for locating said ceramic cylinder

with its outer surface in alignment with the outer surfaces of said nose section and said extended flange section, a low acoustic impedance insulation material between the end surface of said ceramic cylinder and said mating extended flange section of said cup member, a hollow tapered tail section with means for removably attaching said tail section to said ex-



tended flange section of said cup member, means for establishing a waterproof seal between said tail section and said flange section, and a waterproof coating covering the exposed ceramic cylinder and the adjoining regions of said flange section and said nose section which confine the ends of said ceramic cylinder.

3,932,834

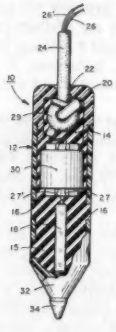
SEISMIC TRANSDUCER ASSEMBLY FOR MARSHY TERRAINS

Byron C. Sutherland, Pearland, Tex., assignor to Walker-Hall-Sears, Inc., Houston, Tex.

Filed Oct. 23, 1973, Ser. No. 408,772

Int. Cl. G01v *1/16*

U.S. Cl. 340—7 R **3 Claims**



1. A seismic transducer assembly for detecting pressure variations in a surrounding liquid medium of a marshy terrain, said assembly comprising:

a flexible cable including at least a pair of electric conductors,

a hollow, rigid, cylindrical casing having an inner cavity, the casing defining in its cylindrical wall a plurality of sound-transmitting windows,

a substantially conically-shaped, rigid bottom end cap for the casing to assist the casing to penetrate into the ground,

at least one hydrophone mounted inside said cavity and having a pair of output terminals,

means in said housing for electrically coupling said terminals to said conductors, and

a sound-transmitting, flexible solid core material completely filling said cavity, said material being adapted to support and protect said hydrophone against mechanical damage while solely transmitting pressure variations from said liquid medium to said hydrophone, said pressure variations becoming converted by said hydrophone into corresponding electric signals.

3,932,835

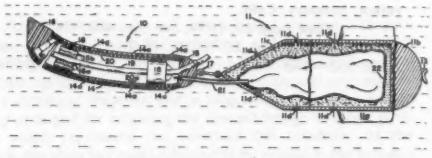
TOWABLE VLF SONAR PROJECTOR

Frank R. Abbott, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 25, 1974, Ser. No. 508,925

Int. Cl.² H04R *1/44*

U.S. Cl. 340—7 R **4 Claims**



1. An improved transducer of acoustic energy comprising:

an elongate sleeve enclosing a gas-filled space and having a first stiffness;

a plurality of cylindrically shaped transducer elements longitudinally spaced in the elongate sleeve each sized to occupy the inner diameter of the elongate sleeve having a hollow interior in communication with the gas-filled space;

means coupled to the elongate sleeve for compliantly defining a gas-filled chamber and having a second stiffness which is more compliant than the first stiffness of the elongate sleeve means, as the elongate sleeve and the chamber defining means are subjected to the same ambient pressure changes, the more compliant chamber defining means yields before the elongate sleeve to transfer gas between its chamber and the hollow interior of each transducer element thereby pressure compensating each transducer element and the material forming the elongate sleeve having the first stiffness and the material forming the chamber defining means having the second stiffness are selected to render the improved transducer essentially neutrally buoyant at a preset depth; and

means coupled to the elongate sleeve for towing the elongate sleeve at the present depth in a water medium, the chamber defining means is carried within the towing means and is in communication with the water medium.

3,932,836

DC/AC MOTOR DRIVE FOR A DOWNHOLE ACOUSTIC TRANSMITTER IN A LOGGING-WHILE-DRILLING SYSTEM

John W. Harrell, Duncanville, and Wallace B. Allen, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 433,029, Jan. 14, 1974, abandoned. This application Sept. 18, 1974, Ser. No. 507,171

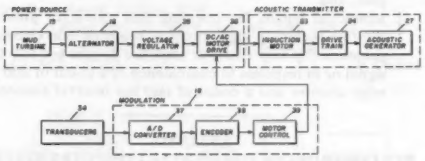
Int. Cl.² G01V *1/40*

U.S. Cl. 340—18 LD **9 Claims**

4. In a borehole logging operation employing a drilling string through which a drilling fluid is circulated, the method

of converting the hydraulic power in the drilling fluid into alternating-current electrical power for driving a two-phase induction motor in a downhole acoustic transmitter, comprising the steps of:

a. rotating a rotary member in response to the hydraulic power of said circulating drilling fluid to convert said hydraulic power into a source of mechanical power,
b. converting said source of mechanical power into a direct-current voltage source,
c. generating clock pulses,
d. generating four signals at a frequency proportional to said clock pulses, said signals being sequentially time shifted 90° with respect to each other,

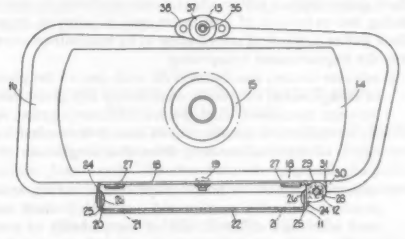


e. applying said direct-current voltage source in a first polarity across both first- and second-phase windings of said motor in response to said first and second signals respectively such that the current flow through said second-phase winding lags the current flow through said first-phase winding by 90°, and
f. reversing the polarity of said voltage source across both said first- and second-phase windings in response to said third and fourth signals respectively such that the direction of the current flow through said windings is reversed 180° from the direction of the current flow in step (e), thereby providing an alternating-current flow through said windings in which the current flow through said second-phase winding continually lags the current flow through said first-phase winding by 90°.

3,932,837
VEHICLE LAMP ASSEMBLY

Alfred Dickens Baker, Solihull, England, assignor to Lucas Electrical Company Limited, Birmingham, England

Filed Dec. 18, 1974, Ser. No. 533,786
Claims priority, application United Kingdom, Jan. 29, 1974, 3977/74
Int. Cl.² F21V 7/00
U.S. Cl. 240—41.6 **6 Claims**

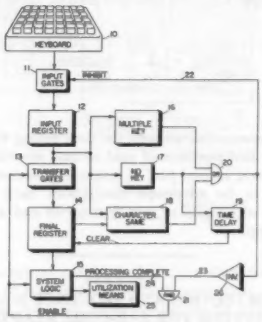


1. A vehicle lamp assembly comprising a body, a mounting bracket including a first portion which is attached to the body for relative pivotal movement about a first axis and a second portion which is adapted to be mounted on a vehicle, the first and second bracket portions being connected together for relative pivotal movement about a second axis which is substantially perpendicular to the first axis, first adjusting means connected between the first bracket portion and the body for effecting relative pivotal movement about said first axis, and second adjusting means for effecting relative pivotal movement between the first and second bracket portions about said second axis.

3,932,838
METHOD AND APPARATUS FOR CONTROLLING CIRCUITRY WITH A PLURALITY OF SWITCHING MEANS

David N. Sitter, Waynesboro, Va., assignor to General Electric Company, Waynesboro, Va.

Continuation of Ser. No. 136,853, April 23, 1971, abandoned. This application Dec. 5, 1973, Ser. No. 421,981
Int. Cl.² G06F 3/02; B41J 5/22
U.S. Cl. 340—146.1 AB **27 Claims**



1. A method for controlling the operation of circuitry in response to an analysis of the operation of individual ones of a plurality of switching means wherein said switching means produces at its output a respective signal in response to operation of individual ones of said switching means comprising the steps of storing a first produced signal in a second storage unit, storing a second produced signal in a first storage unit, replacing the contents of said second storage unit with the contents of said first storage unit, said replacing step comprising sensing the contents of said first storage unit to provide a first indication only in response to the contents of said first storage unit being sensed as representing the operation of only a single switching means, sensing the contents of said first and second storage unit and comparing the sensed contents of said first and second storage units to provide a second indication only in response to the contents of said first storage unit being different from that of the second storage unit, replacing the contents of said second storage unit with the contents of said first storage unit in response to said first and second indications, and controlling the operation of said circuitry in response to the contents of said second storage unit.

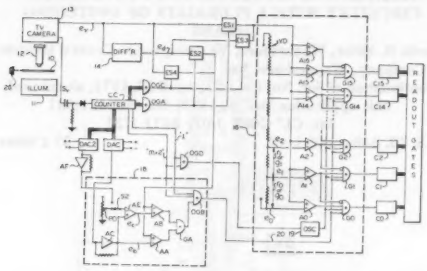
3,932,839
PATTERN ANALYSIS APPARATUS AND METHOD

Richard G. Stephens, 318 Security Mutual Life Bldg., Binghamton, N.Y. 13901

Filed Apr. 24, 1974, Ser. No. 463,723
Int. Cl.² G06K 9/12
U.S. Cl. 340—146.3 AG **20 Claims**

1. Apparatus for analyzing a fixed pattern, comprising, in combination: scanning means for optically scanning said pattern to provide a first electrical waveform substantially commensurate with the light-remissivity of the portions of the pattern being scanned at a given instant and to provide a second electrical waveform substantially commensurate with the light-remissivity gradient of a portion of the pattern scanned substantially at said given instant; first detecting means for detecting those portions of said first electrical waveform which lie within a first pair of levels to provide signals of a first group, each of said signals of said first group having a

duration commensurate with the time during which a respective one of said portions of said first electrical waveform lies within said first pair of levels; second detecting means for detecting those portions of said second electrical waveform which lie within a second pair of levels to provide signals of a second group, each of said signals of said second group having



a duration commensurate with the time during which a respective one of said portions of said second electrical waveform lies within said second pair of levels; and accumulator means connected to be advanced throughout each simultaneous occurrence of a signal of said first group and a signal of said second group.

3,932,840

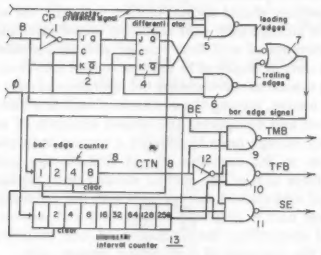
ERROR DETECTION AND SEQUENCE MAINTAINING SYSTEM FOR BAR-CODE READERS

Leland J. Hanchett, Winchester, Mass., assignor to Taplin Business Machines Incorporated, Burlington, Mass.

Continuation of Ser. No. 406,518, Oct. 15, 1973, abandoned. This application Dec. 5, 1974, Ser. No. 529,646

Int. Cl.² G06K *5/00*

U.S. Cl. 340—146.3 Z **6 Claims**



1. An error detection system for bar coded information wherein each character set is a member of a group made up of a predetermined number of bars and a predetermined number of inter-bar spaces of which each bar and each inter-bar space may have one of two different widths, said system comprising

a. means for establishing bar edge signals including means for sensing bars in terms of electric bar signals and a bar signal differentiator;

b. a bar edge counter supplied with said bar edge signals;

c. a first logic gate having a first input formed by said bar edge signals and a second input formed by a predetermined count of said bar edge counter and producing an output signal indicative of too many bars;

d. a clock-controlled character interval counter;

e. a second logic gate having a first input formed by a predetermined count of said bar edge counter and a second input formed by a predetermined count of said character interval counter and producing as output a too few bars signal;

f. a third logic gate having a first input formed by said bar signals, a second input formed by said bar edge signals and a third input formed by the first bar edge count of said bar edge counter to produce an output signal indicative of a sequence error;

g. a bar interval counter;

h. a fourth logic gate responsive to a predetermined count of said bar interval counter and to said predetermined count of said bar edge counter;

i. a character presence flip-flop for producing a character presence signal connected to be set by said bar edge signal and to be reset by the output of said fourth logic gate; and

j. additional means for resetting said character presence flip-flop including logic circuitry resetting said character presence flip-flop either in response to said too few bars signal or in response to coincidence of a count of said bar edge counter and a count of said bar interval counter.

3,932,841

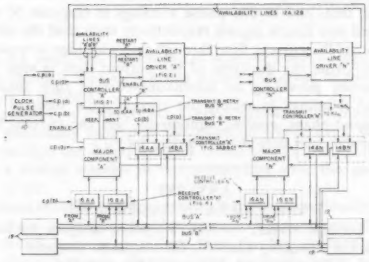
BUS CONTROLLER FOR DIGITAL COMPUTER SYSTEM

Alan J. Deerfield, Newtonville, and Stanley M. Nissen, Reading, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 26, 1973, Ser. No. 409,846

Int. Cl.² G06F *13/00*

U.S. Cl. 340—172.5 **5 Claims**



1. In a digital computer system wherein a plurality of components is interconnected through a common bus, the operation of each one of such components being synchronized by clock pulses from a system clock pulse generator to produce, during the execution of a program and in intervals between clock pulses, a block of information to be transmitted over the bus, the improvement comprising:

a. selector means, associated with each one of the plurality of components, for producing, during any given interval between successive clock pulses, a transmit gating signal for its associated component to enable transmission of a block of information only from that single one of the components;

b. transmitting control and storage means having an independent controller portion and a storage portion associated with each different one of the plurality of components, each one of such portions being responsive to a transmit gating signal simultaneously to couple information from the corresponding one of the components to the bus and also to store such information within such storage portion;

c. receiving means, associated with each one of the plurality of components and the bus, for accepting and storing information transmitted on the bus en route to and addressed to an associated component;

d. means associated with each of the plurality of components for checking parity of information addressed to the

associated component and for producing, when parity is not correctly obtained, an error signal transmitted back to the transmitting components control and storage means; and,

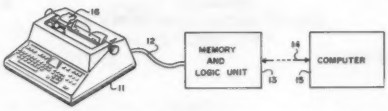
e. means, responsive to the error signal, for inhibiting transmission of further information directly from the corresponding one of the components and for retransmitting the information stored in the transmitting components control and storage means during the next occurring transmit gating signal.

3,932,842

COMPUTER TERMINAL

John J. Kennavane, Seaford, N.Y., assignor to Sanders Associates, Inc., South Nashua, N.H.

Filed Oct. 28, 1971, Ser. No. 193,420
Int. Cl.[2] B41J 15/18; G06F 3/10
U.S. Cl. 340—172.5 8 Claims



1. A terminal device for communicating with a computer, comprising

a first generally cylindrical platen section,

a second generally cylindrical platen section,

a keyboard having a plurality of keys corresponding to various characters,

means responsive to the actuation of said keys for generating a first series of signals in a first code indicative of the corresponding characters,

a memory for storing said first series of signals,

a code converter for receiving said first series of signals from said memory and for generating therefrom a second series of signals in a second code also indicative of said corresponding characters,

means responsive to said second series of signals for printing said characters on paper held against said first platen section,

a communication link,

means including said code converter for receiving signals over said communication link in said first code and for generating therefrom a third series of signals in said second code, and

means responsive to said third series of signals for printing characters indicative thereof on paper held against said second platen section.

3,932,843

REAL-TIME CONTROL ARRANGEMENT FOR A SIMULATION DEVICE

Jean Marie Treiut, La Celle St. Cloud; Jean Bernard Michel Liot, Bailly; Therese Marie Leonie Cagnac, Paris, and Antoine Jean Louis Chambet-Falquet, Igny, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 23, 1973, Ser. No. 418,649
Claims priority, application France, Nov. 30, 1972, 72.42564
Int. Cl. G06f 15/16
U.S. Cl. 340—172.5 9 Claims

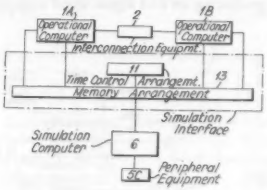
1. A simulation device designed for the development of a program to be used in a real-time operated system including first and second computers operating on a load-sharing basis, said simulation device comprising:

a third computer coupled to said first and second computers to simulate their peripheral equipment in a real system by exchanging with said first and second computers data which would normally be exchanged between said first and second computers and their real system peripheral equipment; and

a real-time control arrangement including

a real-time counter coupled to said first, second and third computers to count real operation time of a program for said real-time system, to subdivide said real operation time into equal steps and to transmit a predetermined signal at the end of each of said steps,

a shift counter coupled to said first, second and third computers to delay the turning on of one of said first and second computers with respect to the turning on of the other of said first and second computers by a time equal to the time elapsed between a stopping of said one of said first and second computers and a stopping of said other of said first and second computers when



both stoppings occurred after a simultaneous operating period of said first and second computers,

two timing counters, each of said timing counters being coupled to a different one of said first and second computers and said third computer to delay the turning on of an associated one of said first and second computers with respect to the turning on of the other of said first and second computers by a time equal to a simulated selected real system peripheral equipment response time after said associated one of said first and second computers was stopped due to the transmission of a data input-output order to a simulated selected real system peripheral equipment, and

a clock to synchronize the operation of said first, second and third computers, said real-time counter, said shift counter and said two timing counters.

3,932,844

COMMON CONTROL SWITCHING SYSTEM

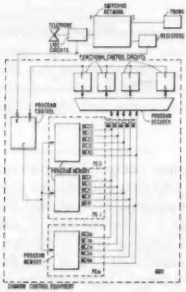
Teruo Yokoo, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Jan. 8, 1973, Ser. No. 322,047
Claims priority, application Japan, Jan. 11, 1972, 47-4959
Int. Cl. G06f 15/46
U.S. Cl. 340—172.5 4 Claims

1. A telecommunications switching system comprising common control equipment and a plurality of connection operation equipment groups, each group consisting of a plurality of connection operation equipment, each connection operation equipment in said groups being capable of carrying out a connection operation specific to each said group, each connection operation equipment of at least two of said groups comprising an initiation signal circuit responsive to a call reaching thereto and requesting a connection to be established through said switching system for producing an initiation signal, the connections to be established through said switching system being classified into a plurality of types, said initiation signal being of a level representative of the type of connection requested by a call responsive, to which said initiation signal is produced, a connection of each of said types being established by making selected connection operation equipment, selected in compliance with said each type of connection, sequentially carry out connection operations specific thereto, said common control equipment comprising

a plurality of functional block circuits and control means, connection operation equipment of each of said groups being coupled to at least one of said functional block circuits, said control means being coupled to the initiation signal circuits and to said functional block circuits and responsive to the level of an initiation signal produced by one of said initiation signal circuits for selecting functional block circuits in compliance with the type of connection represented by the said level and for causing the selected functional block circuits to select connection operation equipment, one from each of the groups of connection operation equipment coupled to the selected functional block circuits, thereby causing the selected connection operation equipment to sequentially carry out connection operations specific thereto to establish the connection of the type represented by said initiation signal level, wherein the improvement comprises:

a. end signal means in each of said functional block circuits for producing an end signal upon completion of the con-



nection operation of one of connection operation equipment selected by said each functional block circuit,

b. start signal means in each of said functional block circuits responsive to a start signal delivered thereto for initiating operation of said functional block circuits,

c. a plurality of start signal generating means, each being connected and adapted for applying start signals in sequence and in preselected order to start signal means in said functional block circuits, each said generating means comprising a memory means for storing information indicia representative of said respective preselected order, and

d. a control circuit responsive to the level of said initiation signal for selecting in accordance with said level one of said start signal generating means, and further responsive to said initiation signal and each said end signal for stepping said selected start signal generating means to cause said selected start signal generating means to generate the next start signal in its preselected order.

3,932,845

SPECIALIZED DIGITAL COMPUTER WITH DIVIDED MEMORY AND ARITHMETIC UNITS

Alain Beriot, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 22, 1974, Ser. No. 435,593

Claims priority, application France, Jan. 26, 1973, 73.02836

Int. Cl.² G06F 7/38, 13/06

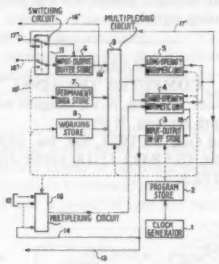
U.S. Cl. 340—172.5 **7 Claims**

1. A digital computer comprising:

memory means including a program store and additional storage means, said program store being provided with a timing input;

calculating means including a short-operation arithmetic unit and a long-operation arithmetic unit, said additional storage means being addressable by said program store for reading out instructions for said calculating means;

multiplexing means inserted between said additional storage means and said calculating means for selectively directing



said instructions to said short-operation and long-operation arithmetic units under the control of said program store; and

clock means connected to said timing input for triggering said program store into correlated activation of said memory, multiplexing and calculating means.

3,932,846

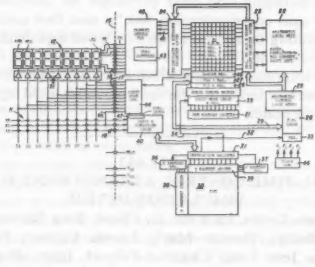
ELECTRONIC CALCULATOR HAVING INTERNAL MEANS FOR TURNING OFF DISPLAY

Charles W. Brixey, Missouri City; Glenn A. Hartsell, Dallas, both of Tex., and Jerry L. Vandierendonck, Santa Cruz, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 24, 1973, Ser. No. 400,438

Int. Cl.² G06F 3/14

U.S. Cl. 340—172.5 **8 Claims**



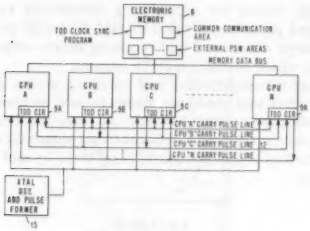
1. An electronic calculator system having data storage means, arithmetic means for executing arithmetic operations on data in the data storage means, a read-only-memory for storing a large number of program instruction words, instruction register means for receiving instruction words from the read-only-memory, first gating means for controlling transfer of instruction words from the read-only-memory to the instruction register, address register means for defining a location in the read-only-memory, second gating means for controlling transfer of parts of the instruction word from the instruction register to the address register means, control means for receiving parts of the instruction word from the instruction register means and for controlling operation of the

arithmetic means and other parts of the system, one instruction word being executed during each machine cycle, means for incrementing the address register means by one upon command, characterized in that first control circuitry is provided to inhibit said first gating means for transferring instruction words from the read-only-memory to the instruction register for a plurality of machine cycles whereby the same instruction word is repeatedly executed, and second control circuitry is provided to cause the address register means to be repeatedly incremented during said plurality of machine cycles, and third control circuitry is provided to actuate the second gating means when the address register means overflows.

3,932,847
TIME-OF-DAY CLOCK SYNCHRONIZATION AMONG MULTIPLE PROCESSING UNITS

Ronald Morton Smith, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 6, 1973, Ser. No. 413,296
Int. Cl.² G06F *1/04*
U.S. Cl. 340—172.5 **5 Claims**



1. A synchronization system for time-of-day (TOD) clocks in a multiprocessing system, in which all said clocks receive driving pulses from a common oscillator, each TOD clock including a plurality of sequentially arranged bistable circuits, a synchronization circuit associated with each respective TOD clock, each synchronization circuit including

carry output means connected to a selected bistable circuit of an associated TOD clock, the selected bistable circuit having a pulse period which is longer than human physical reaction time, the carry output means providing a carry pulse output,

a synch check circuit including

phase detector means having inputs connected to carry pulse outputs of all carry output means in the synchronization system to detect when all received carry pulses are in-phase with each other, the phase detector providing an output signal when any received carry pulse is out-of-phase with another received carry pulse to provide a TOD synch check interrupt signal to an associated processor,

a TOD clock synch switch,

a first AND circuit having one input conditioned by a setting of the TOD clock synch switch and another input enabled in response to an output of the synch check bistable circuit,

means for blocking driving pulses to the associated TOD clock in response to an output of the first AND circuit to stop the operation of the associated TOD clock,

TOD gating means connected to an output of the first AND circuit for transferring into the associated TOD clock a stored predetermined future time setting relating to another TOD clock used as a standard TOD clock, the future time setting indicating the time to occur at a predetermined subsequent carry pulse of the standard TOD clock,

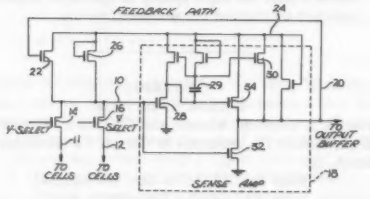
means for unblocking the driving pulses to the associated TOD clock in response to the predetermined subsequent carry pulse from the output of the OR circuit, in order to start the associated TOD clock at the time occurrence of the future time setting transferred by the TOD gating means,

whereby the associated TOD clock is started in time synchronization with the standard TOD clock.

3,932,848
FEEDBACK CIRCUIT FOR ALLOWING RAPID CHARGING AND DISCHARGING OF A SENSE NODE IN A STATIC MEMORY

Eli Porat, Albany, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 20, 1975, Ser. No. 542,253
Int. Cl.² G11C *7/06*
U.S. Cl. 340—173 R **10 Claims**



1. In a static memory having a charged sense node which is selectively coupled to memory cells in the memory for sensing the state of such cells, a charging means for charging said sense node, and a sense amplifier having its input coupled to said sense node, an improvement comprising:

control means for controlling the flow of current coupled to said sense node; and

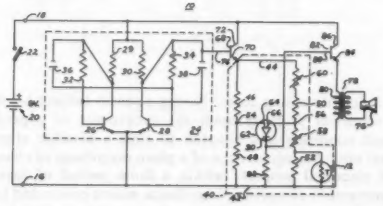
feedback means coupled between said sense amplifier and said control means for controlling the flow of current at said sense node;

whereby said sense node may be rapidly charged and discharged since the voltage swing at the node is restricted.

3,932,849
SELF-CONTAINED, CONDITION RESPONSIVE CIRCUIT

Stanley B. Welch, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed June 24, 1974, Ser. No. 482,267
Int. Cl.² G08B *17/06*
U.S. Cl. 340—228 R **9 Claims**



1. A self-contained, condition responsive circuit of the type having condition sensing impedance means for supplying an indication of a predetermined external condition to be sensed, the circuit comprising:

a pair of input supply terminals adapted to be coupled to an electrical energy source for supplying direct current;

means coupled across the input supply terminals for generating a repetitive pulsed signal at an audio frequency rate;

a four-leg impedance bridge network having first and second common terminals arranged to be coupled across the input supply terminals and two comparison terminals intermediate respectively the first and second legs of the bridge network and the third and fourth legs;

means associated with the circuit for coupling the bridge network across the input supply terminals at an audio frequency rate in response to the audio frequency pulsed signal;

a threshold device coupled to the comparison terminals of the bridge network to function as a threshold detector therefor;

the condition sensing impedance means being coupled in circuit with one of the legs of the bridge network;

means associated with the circuit for giving an indication when a predetermined external condition is sensed; and

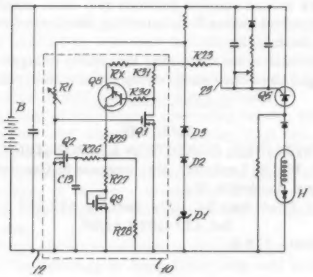
means associated with the circuit for coupling the indication means across the input supply terminals in response to a switched-on state of the threshold device.

3,932,850

WARNING DEVICE

Frederick J. Conforti, Aurora, and Clifford E. Mensing, Glen Ellyn, both of Ill., assignors to Pittway Corporation, Northbrook, Ill.

Filed Jan. 22, 1975, Ser. No. 543,145
Int. Cl.² G08B *17/10*; H03K *5/20*
U.S. Cl. 340—237 S **14 Claims**



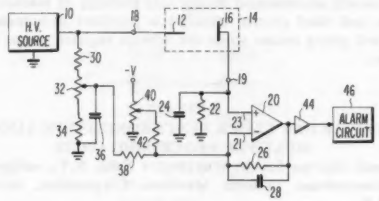
13. In a detecting device having a sensor subject to change an electrical property upon the occurrence of a predetermined condition and adapted to emit a sensible electrical signal upon the occurrence of a given magnitude of change in said electrical property within a finite period of time, the improvement comprising impedance means connected to said sensor and capable of matching the impedance of said sensor over a wide range of changes of said electrical property, amplifier means connected to the junction of said sensor and said impedance means, said amplifier means having an input and an output and amplifying said changes in the electrical property, and feedback means connecting said output of said amplifier means to said impedance means, said feedback means having time delay means for delaying feeding the amplifier output to said impedance means.

3,932,851

AEROSOL DETECTOR

Martin Rayl, Trenton, and Harold Duane Hanson, East Brunswick, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed June 5, 1974, Ser. No. 476,442
Int. Cl.² G08B *17/10*
U.S. Cl. 340—237 S **9 Claims**



1. Apparatus for detecting aerosols in a gas comprising:

discharge means having an electrode about which a corona discharge is developed when coupled to a source of given potential;

receiving means for receiving a continuous current of charged particles provided by said discharge means, said discharge means and said receiving means arranged in a gas in which aerosols may be present;

reflecting means adjacent said receiving means and separated from said discharge means by said receiving means for reflecting aerosols towards said receiving means; and

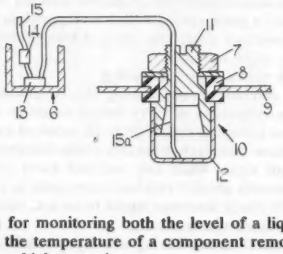
sensing means coupled to said receiving means for detecting the current of charged particles received by said receiving means.

3,932,852

LIQUID LEVEL DETECTION SYSTEMS

William Frank Hill, Stafford, England, assignor to Lucas Electrical Company Limited, Birmingham, England

Filed Oct. 25, 1973, Ser. No. 409,449
Claims priority, application United Kingdom, Nov. 17, 1972, 53085/72
Int. Cl.² G08B *21/00*
U.S. Cl. 340—244 R **1 Claim**



1. A system for monitoring both the level of a liquid in a container and the temperature of a component remote from said container, which comprises:

monitoring means in a liquid container which is electrically grounded, which contacts the liquid at a first location in said container when the liquid level is above a predetermined level;

a positive temperature coefficient resistor mounted at a second location on said component, remote from said container, said resistor being electrically insulated from said component at said second location whose temperature is desired to be monitored;

one terminal of said positive temperature coefficient resistor being connected to ground through said monitoring means and said liquid in series, so that if the liquid level

falls below said predetermined level, the impedance to ground will be substantially increased;

the other terminal of said positive temperature coefficient resistor being connected to a circuit which includes means for providing a warning if the impedance to ground increases substantially as a result of either said liquid falling below said predetermined level at said first location or if the resistance of said positive temperature coefficient resistor changes as a result of an excessive rise in temperature at said second location.

3,932,853

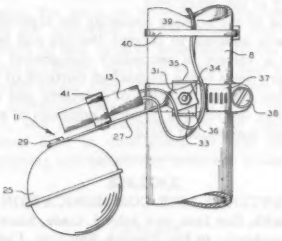
APPARATUS FOR WARNING OF THE FAILURE OF A SUMP PUMP

Richard A. Cannon, 4752 Broad Road, Syracuse, N.Y. 13021

Filed Apr. 30, 1974, Ser. No. 465,492

Int. Cl.² G08B *21/00*

U.S. Cl. 340—244 B **1 Claim**



1. Apparatus for warning of the failure of a sump pump for pumping water from a sump, the sump having a discharge pipe extending vertically from the sump, said apparatus comprising:

a normally open electric circuit having a storage battery as a source of electricity;

an electrical alarm in said electric circuit for emitting a warning signal in response to the closing of said electric circuit;

float means positioned in the sump for moving with the level of water in the sump, said float means comprising a support arm pivotally mounted at one end on said discharge pipe, and a float attached to the other end of said support arm for effecting the rotation of said support arm in response to changes in the level of water in the sump;

constraining means for constraining the rotation of said support arm, said constraining means being mounted on said discharge pipe;

a mercury switch mounted on said support arm for closing said electric circuit in response to movement of said float means above a position coincident with a water level in the sump indicative of sump pump failure, for closing said electric circuit to effect the emission of said warning signal; and

a test switch connected in said circuit for selectively closing said electric circuit to determine whether said storage battery is of sufficient strength to activate said electrical alarm.

3,932,854

APPARATUS FOR THE DETECTION OF BREAKS IN MOVING THREADLINES

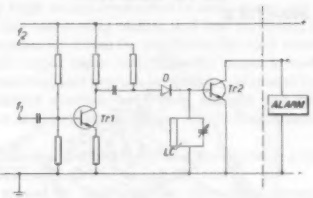
Wolfgang Wetzel, Landau, and Manfred Müller, bad Mingolsheim, both of Germany, assignors to Imperial Chemical Ind. (Europa) Fibres, Ostringen, Germany

Filed May 8, 1972, Ser. No. 251,732

Claims priority, application Germany, May 18, 1971, 2124693

Int. Cl.² G08B *21/00*

U.S. Cl. 340—259 **19 Claims**



1. A device for detecting a break in a travelling threadline comprising a driven roll and an idler roll between which the threadline passes, said idler roll being driven by the motion of the thread and means to monitor the speed of rotation of the idler roll wherein said means emits a signal when said speed varies by at least a pre-determined amount thus indicating a break in the threadline, wherein said idler roll itself provides a means to monitor its speed of rotation by generating an alternating current by the rotation of the idler roll, the frequency of said current being dependent on the speed of rotation of the roll so that the speed of rotation may be monitored by monitoring the frequency of the alternating current wherein the alternating current generated by the idler roll is combined with a standard frequency and fed to a tuner which is tuned to respond to a pre-determined difference between the input frequency and the standard frequency.

3,932,855

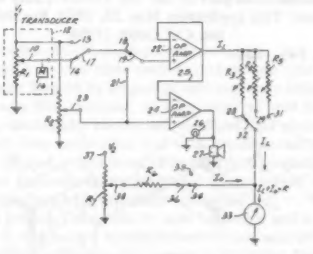
CRANE RADIUS INSTRUMENT

Martin W. Hamilton, Arlington Heights, Ill., assignor to Eaton Corporation, Ohio

Filed Sept. 6, 1974, Ser. No. 503,660

Int. Cl.² G08B *21/00*

U.S. Cl. 340—267 C **8 Claims**



1. Means for indicating the operating radius of a crane comprising, a transducer mounted on the boom of said crane and producing an electrical signal proportional to cosine θ, where θ is the angle of said boom with the horizontal plane, a first resistor having a conductance related to the length of said boom receiving the output of said transducer and supplying a current proportional to $L\cos\theta$ where L is the length of said boom, a first potentiometer supplying a current proportional to the offset distance which is the distance from the

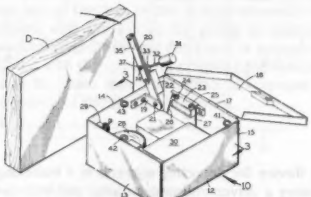
boom hinge point to the rotating axis of said crane, and an indicator receiving the currents proportional to $L\cos\theta$ and the offset distance to indicate the operating radius of said crane.

3,932,856

PORTABLE, GRAVITY-ACTUATED ALARM FOR USE WITH A WINDOW OR DOOR

Leo J. Tremont, 1108 SW. 25th Ave., Fort Lauderdale, Fla. 33312

Filed Dec. 9, 1974, Ser. No. 530,594
Int. Cl.² G08B 13/08
U.S. Cl. 340—274 R 13 Claims



1. In an intrusion alarm device for a door or window comprising:

a lever for engagement with a door or window when the latter is closed, means pivotally mounting said lever to drop down by gravity when the door or window is opened;

a magnetic switch having a permanent magnet on said lever and magnetically-operated switch means mounted in spaced relationship to said mounting means for the lever for operation by said magnet when the lever drops down;

and signalling means operable to signal an alarm when said switch means is operated;

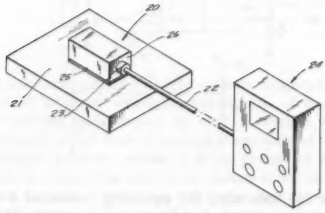
the improvement wherein said switch means is positioned to one side of the path of movement of said lever when the latter drops down and is in close proximity to said magnet when the lever is down.

3,932,857

ALARM SYSTEM SENSING DEVICE

Blaine A. Way, Schenectady, and William R. Scholtz, Scotia, both of N.Y., assignors to Salient Electronics, Inc., Schenectady, N.Y.

Continuation-in-part of Ser. No. 159,697, July 6, 1971, abandoned. This application May 23, 1974, Ser. No. 472,742
Int. Cl.² G08B 21/00
U.S. Cl. 340—280 5 Claims



1. An attachment mechanism for use in an alarm system sensing device comprising:

a housing having one surface physically divided into two mechanically separable component parts;

the outer exposed surfaces of the two separable component parts containing chemically adhesive material so as to allow the device to be adhesively attached to the surface of an object in a manner wherein two chemical bonds of attachment occur between the surface of the object and the respective surface areas of each of the two mechanically separable component parts;

one of the two separable component surface parts containing means for mechanical interconnection to the structure of the protective housing in a manner which creates a mechanical strength of attachment which is superior to the relative strength of attachment of the adhesive bonding which occurs between that same separable component part and the surface of an object when it is attached thereto;

the second of the two separable component parts containing means for mechanical interconnection to the structure of the protective housing in a manner which creates a mechanical strength of attachment which is inferior to the relative strength of attachment of the adhesive bonding which occurs between that same separable component part and the surface of an object when it is attached thereto;

the relationship of relative adhesive and mechanical strengths of interconnections between the object surface, the two separable component parts, and the protective housing being such that the forceable detachment of the device from the surface of an object to which it has been adhesively attached will result in the physical displacement of the two separable component parts relative of one part to the other; and

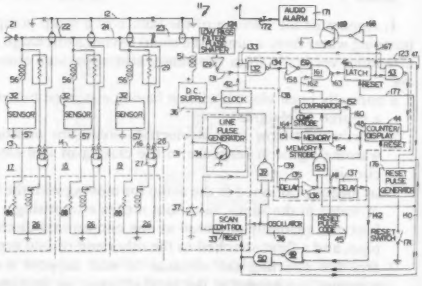
the interior of the housing including the separable component parts adapted to receive therein and be attached thereto a variety of secondary component parts, said secondary parts being themselves portions of instrument measuring systems capable of detecting and reacting to changes in the relative physical positions of at least two separable component parts.

3,932,858

MASTER ANTENNA LINE COMMUNICATION SYSTEM

James O. Smith, San Jose, and John J. Gade, Sunnyvale, both of Calif., assignors to Inn-Tronics, San Jose, Calif.

Continuation of Ser. No. 330,598, Feb. 8, 1973, abandoned. This application July 25, 1974, Ser. No. 491,656
Int. Cl.² G08B 13/14
U.S. Cl. 340—280 5 Claims



1. In combination with an antenna system having an antenna for receipt of a communication signal and a common antenna line connected between said antenna and a plurality of locations for common distribution of such communication signal to said plurality of locations; transmitting means for generating a querying information signal different from said communication signal directly connected into said antenna like for distribution of such information signal over said line to said plurality of locations; a plurality of sensors, each of which is connected to said antenna line at an associated one of said locations for receipt of said information signal and includes means responsive to receipt of said information signal

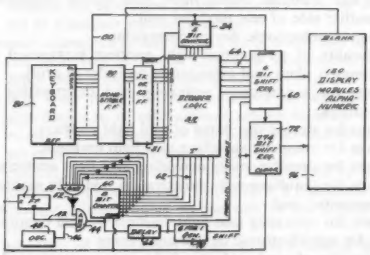
by selectively generating and applying a reply information signal to said antenna line in response to a predetermined condition of the sensor circuitry; receiving means connected to said antenna line for generating an alarm signal in response to receipt within a selected time interval of a predetermined number of reply information signals from any one of said sensors; and means on said antenna line for preventing said information signal and any communication signal on said antenna line from interfering with one another; said transmitting means continually generating successive querying signals and distributing the same over said antenna line to said plurality of sensors, and said receiving means generating said alarm signal in response to receipt of a pair of reply signals spaced in time from one another an interval indicative of one of said sensors generating said reply signals in response to succeeding ones of said querying signals; each of said successive querying signals generated by said transmitting means being an electrical scan pulse having a predetermined time of initiation; each of said sensors including timing means adapted to apply a reply signal to said antenna line if said predetermined condition of said sensor circuitry exists at a predetermined time after receipt thereby of said scan pulse, which predetermined time is different for each of said sensors; said receiving means including means for distinguishing between reply pulses received from different ones of said sensors on the basis of the time at which said reply pulse is sent thereto after transmittal of an electrical scan pulse on said line; power supply regulating means for receiving electrical power on said antenna line and regulating the same to provide an essentially constant power level for operation of said sensor; and said timing means of each of said sensors including means providing a time constant for setting said time at which said sensor generates said reply signal after receiving said scan pulse signal, means for generating said reply signal after said predetermined time, and means responsive to the passage of said predetermined time as determined by said time constant means by causing said generating means to initiate said reply signal.

3,932,859

ELECTRONIC DICTIONARY WITH WORD LENGTH RESPONSIVE DECODER

Patricia Faust Kyriakides, and James R. Story, both of Miami, Fla., assignors to Anastasios Kyriakides, Miami, Fla.

Filed Mar. 7, 1974, Ser. No. 449,083
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 R **7 Claims**



1. An electronic dictionary comprising: keyboard means having a plurality of character keys for entering character symbols which form a word and producing an electrical signal upon each such entrance identifying the character thus entered, and a definition key for producing a definition signal upon operation thereof,

means for receiving said electrical signals and storing for each symbol which can be entered an electrical stored indication of whether that symbol has been entered,

means for receiving said electrical signals, counting the number of symbols entered and producing an output signal indicating that count,

pulse generator means for producing a train of pulses upon operation of said definition key,

counter means for receiving said train of pulse and providing a count output indicating the number of pulses counted,

logic means connected to said pulse generator means and to said counter means for disabling said pulse generator means when the output of said counter means indicates a given count,

decoder logic means connected to said counter means, said receiving and storing means, and said receiving, counting and producing means for producing for each combination of said output signal indicating the count in said receiving, counting and producing means, said stored indication of whether symbols have been entered and said count output of said counter means a definition character signal,

register means, for receiving and storing in a given order said definition character signals, and

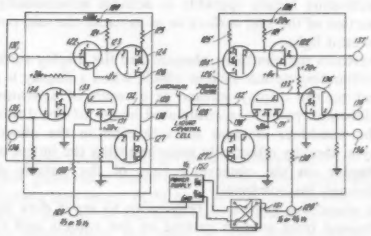
display means for displaying the characters corresponding to said stored definition character signals.

3,932,860

ELECTRO-OPTICAL DISPLAY WITH CIRCUITRY FOR APPLYING PREDETERMINED POTENTIALS TO ALL DISPLAY SEGMENTS TO EFFECT ACTIVATION OF A SELECTED SEGMENT ONLY

Sam G. Cohen, Pleasantville, N.Y., assignor to Timex Corporation, Waterbury, Conn.

Filed Apr. 25, 1974, Ser. No. 463,927
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 M **11 Claims**



1. An electro-optical display comprising:

a first and a second plate each having on one side thereof a pattern formed by segments, said segments being layers of conductive material, at least some of said segments being electrically connected together; said plates being spaced from each other and with the segments on each plate aligned; a thin layer of liquid crystal material sandwiched between said plates, said liquid crystal material characterized by a threshold voltage of V_t;

a driver circuit connected to said segments and a voltage source of V_s connected to said driver circuit, said driver circuit having first voltage supply means to provide a first selectable segments of the first plate a voltage V_1 which is a fraction of V_s and less than V_t, second voltage supply means to provide to first selectable segments of said second plate with a voltage V_2 greater than V_1 and a fraction of V_s, wherein $V_1 + V_2 = V_s$ and $V_2 < V_t > V_1$, third voltage supply means to supply voltage V_s to second selectable segments of the first plate and fourth means to switch second selectable segments of the second plate to zero voltage, whereby the liquid crystal material between the first segments is not activated and the liquid crystal material between the second segments is activated.

3,932,861

VEHICLE HEAD-UP DISPLAY SYSTEMS

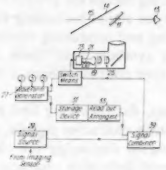
George Carter Bull, East Malling, England, assignor to Elliott Brothers (London) Limited, Essex, England

Filed Apr. 29, 1974, Ser. No. 464,739

Claims priority, application United Kingdom, Apr. 30, 1973, 20399/73

Int. Cl.[2] G06F 3/14

U.S. Cl. 340—324 AD 3 Claims



1. A head-up display system for a vehicle comprising:

a. a semi-reflective combiner element adapted to be installed in the vehicle on the line of sight of an observer in the vehicle of a scene outside the vehicle;

b. a display surface;

c. activating means operable to activate substantially any portion of the said surface so as to cause the said portion to emit light;

d. between the combiner element and the display surface a collimating optical system which, when a display is present on the display surface as a result of activation as aforesaid, projects a collimated image of the display to the combiner element for reflection to the observer's eyes, thereby effectively superimposing the image of the display on the observer's view of the outside scene through the combiner;

e. a waveform generator responsive to input data signals derived from sensors carried by the vehicle and representing the relationship of the vehicle to its environment so as to repetitively develop a time sequence of output signals capable of being employed for controlling the activating means to activate desired line segments of the display surface thereby to present at said surface symbols representative of the aforesaid relationship;

f. a signal source operable to develop a raster scan output signal representative of the environment sensed by an imaging sensor;

g. a symbol storage device operable in response to output signals from the waveform generator so as to store symbols to be presented at the display surface;

h. a symbol read-out arrangement operable to develop a raster scan output signal representative of the symbols stored in the symbol storage device, said output signal having the same format as the signal source output signal;

i. signal combiner circuitry operable to receive the output signals from the signal source and the symbol read-out arrangement so as to develop a raster scan output signal representative of both said symbols and said environment; and

j. means for connecting either the output of signal combiner circuitry or the output of the waveform generator to the activating means.

3,932,862

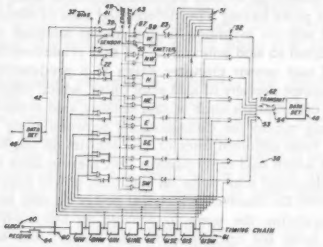
COLORINGBOOK, A SOLID STATE DISPLAY DEVICE

Robert Michael Graven, 203 Holly Lane, Orinda, Calif. 94563

Continuation of Ser. No. 250,836, May 5, 1972, abandoned, which is a division of Ser. No. 111,659, Feb. 1, 1971, Pat. No. 3,761,620, which is a division of Ser. No. 33,855, May 1, 1970, Pat. No. 3,618,029, which is a continuation-in-part of Ser. No. 644,756, May 25, 1967, abandoned. This application Apr. 2, 1975, Ser. No. 564,425

Int. Cl.[2] G06F 3/14

U.S. Cl. 340—324 M 11 Claims



1. An optoelectronic device comprising

a modular circuit unit having

a pn junction light emitter, and

a semiconductor light sensor juxtaposed in a common plane to permit emission and reception of light on one common side of said module,

said emitter and sensor positioned to operate optically independently of each other, and

means for electrically connecting said modular circuit unit to like modular circuit units, said means disposed on another side of said modular unit.

6. An optoelectronic device comprising

a plurality of pn junction light emitters juxtaposed in a common plane and arranged in an ordered array,

means for sequentially activating and deactivating said emitters,

means for storing the status of said light emitters,

means for manually switching said light emitters,

means for simultaneously activating said light emitters,

means for simultaneously deactivating said light emitters, a computer, and

means for operating said light emitters by said computer.

10. An optoelectronic device comprising

a plurality of semiconductor light sensors juxtaposed in a common plane and arranged in an ordered array,

means for individually activating and deactivating said light sensors,

means for storing the status of activation and deactivation of said sensors,

a computer,

means connected to said computer for determining the activated status of said sensors,

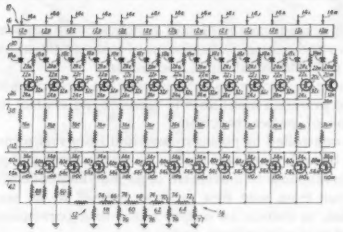
a penlight, and

means for activating said sensors using said penlight.

3,932,863
DIGITAL-TO-ANALOG CONVERTERS

James J. Pastoriza, Lincoln, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Continuation of Ser. No. 207,463, Dec. 13, 1971, abandoned, which is a division of Ser. No. 809,700, March 24, 1969, Pat. No. 3,685,045. This application July 5, 1974, Ser. No. 486,220
Int. Cl.² H03K *13/04*
U.S. Cl. 340—347 DA 2 Claims



1. A digital-to-analog converter comprising a first set of individually-activatable transistor current sources arranged to conduct currents of equal magnitude producing equal current densities in the transistors;

said transistors each having collector, emitter and base electrodes;

a plurality of equal current-setting resistors each connected between the emitter of a respective transistor and a common power supply line;

means to maintain the bases of said transistors at a substantially constant potential, whereby when said transistors are activated they produce said equal current through the collector circuits of said transistors;

a second set of individually-activatable transistor current sources for controlling said first set of current sources;

said second set of transistors each having collector, emitter and base electrodes;

means connecting the collectors of said second set of transistors respectively to the emitters of said first set of transistors to provide for controlling the flow of current through the corresponding current-setting resistor to control the activation of the associated one of said first set of transistor current sources;

means connected to said second set of transistors to control the individual actuation thereof in accordance with an input binary number thereby to control the flow of current from each transistor collector through the corresponding one of said current setting resistors so as to control the activation of the associated one of said first set of transistor current sources;

a current summing point to which a plurality of separate currents can be directed to produce a combined output current corresponding to the sum of the separate currents;

a plurality of attenuation networks each having an input circuit and an output circuit and arranged, when supplied with an input current, to provide an output current the magnitude of which is a predetermined fraction of the input current;

said attenuation networks having differing attenuations in accordance with a predetermined weighting pattern, such that if the same current is supplied to said input circuits, the corresponding output currents from said networks will differ in accordance with said weighting pattern;

means connecting each of said input circuits directly to the collector circuit of a respective one of said first set of transistor current sources to provide equal input currents thereto from the activated current sources;

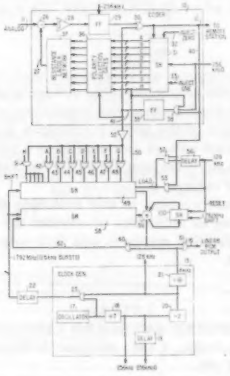
said attenuation networks being arranged to present equal impedances to each of said collector circuits in said first set of transistor current sources; and

means connecting all of said attenuation network output circuits together and to said current summing point, whereby to supply thereto currents of differing magnitudes in accordance with said predetermined weighting pattern.

3,932,864
CIRCUIT FOR CONVERTING A COMPANDED DIGITAL TIME-AMPLITUDE PULSE CODE INTO A LINEAR DIGITAL AMPLITUDE PULSE CODE

James Charles Candy, Convent Station, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 6, 1975, Ser. No. 538,592
Int. Cl.² H03K *13/24*
U.S. Cl. 340—347 DD 6 Claims



1. A pulse code translator for translating plural *n:m* coded, nultibit, pulse code words of a predetermined time-amplitude resolution into linear PCM code words each having a predetermined number of bits sufficient to have an amplitude resolution substantially the same as said predetermined time-amplitude resolution, said translator comprising

means for averaging magnitude information represented by successive pairs of said *n:m* code words, and

means for averaging a plurality *w* of successive words from said word-pair averaging means to produce a single linear PCM word.

3,932,865
ANALOG-TO-DIGITAL CONVERTER

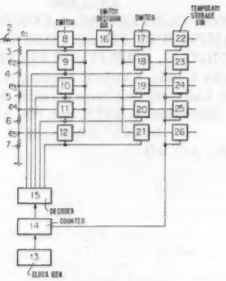
Iwao Sagara; Hirohisa Shishikura, and Ikuo Anada, all of Tokyo, Japan, assignors to Oki Electric Industry Company, Ltd., Tokyo, Japan

Filed May 22, 1974, Ser. No. 472,480
Claims priority, application Japan, May 25, 1973, 48-57841; May 25, 1973, 48-57844
Int. Cl.² H03K *13/02*
U.S. Cl. 340—347 AD 3 Claims

1. An analog-digital converter circuit for converting an analog voltage input to a digital output comprising:

a. voltage divider means, said voltage input being applied across said voltage divider means, said voltage divider means producing a plurality of voltages having amplitudes related to said input voltage;

b. a plurality of first switch means, each first switch means being coupled to said voltage divider means;
c. control means coupled to each of said switch means for sequentially closing said first switch means in a predetermined sequence;
d. switching decision means coupled to said first switch means, wherein when each first switch means is closed, the voltage at the point in said voltage divider means to which the first switch means is coupled is applied to said switching decision means, said switching decision means

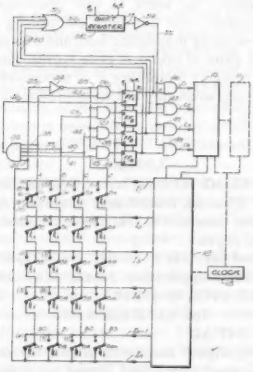


comparing the amplitude of the voltage applied thereto to a predetermined voltage and producing a first output if the amplitude of the applied voltage is greater than the predetermined voltage and producing a second voltage if the amplitude of the applied voltage is less than the predetermined voltage; and
e. output means coupled to said switching decision means for providing an indication of whether the output of said switching decision means is said first output or said second output.

3,932,866
COMPUTER KEYBOARD CIRCUITRY

Hiroshi Sasaki, Irvine, Calif., assignor to Ricoh Electronics, Inc., Irvine, Calif.

Filed July 24, 1974, Ser. No. 491,446
Int. Cl.² G08C 1/100
U.S. Cl. 340—365 E 14 Claims



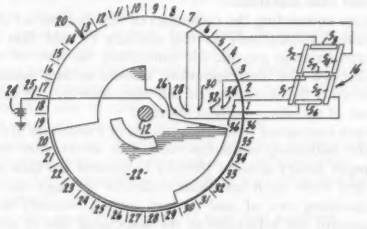
1. Apparatus comprising:

a plurality of principal input lines;
additional input line means;
a plurality of output lines;
pulse supply means for delivering out-of-phase streams of timed input pulses to said principal input lines, and for delivering timed additional input pulses to said additional input line means in out-of-phase relation with respect to the pulses in said principal input lines;
an array of switches for controlling the delivery of output signals to said output lines and each having first and second contact means responsive to actuation of the corresponding switch to first and second positions respectively;
said first contact means of said switches being adapted to receive and control transmission of said additional pulses from said additional input line means;
said second contact means of said switches being connected to said principal input lines to receive, and control transmission of, pulses therefrom;
circuits controlled by pulses transmitted from said principal input lines through said second contact means, and operable in response to movement of an individual one of said switches from said first position thereof to its second position to deliver an output signal to a corresponding one of said output lines, and
means controlled by said additional pulses transmitted from said additional input line means through said first contact means of said switches, and operable only when all of said switches are simultaneously in said first position to condition said apparatus for delivery of a next successive output signal to one of said output lines, and thereby preventing delivery of such a next successive signal until any previously actuated switch has returned to said first position thereof.

3,932,867
TELEVISION CHANNEL INDICATOR

Eugene C. Walding, Arlington Heights, Ill., assignor to Oak Electro/Netics Corporation, Crystal Lake, Ill.

Filed May 8, 1972, Ser. No. 251,461
Int. Cl.² G08B 5/00
U.S. Cl. 340—378 R 3 Claims



1. In a television channel indicator, a rotatable shaft, a pair of electricially conductive coded surfaces, means supporting said coded surfaces for rotation with said shaft, a pair of electricially-operated visual read-out devices, each having independent areas capable of being energized to display the digits 0–9,

a source of voltage connected to a common area on each of said coded surfaces, pick-up means for each of said independent areas and each of said pick up means being directly connected to an independent area, said pick-up means being positioned to contact said coded surfaces such that the various independent areas are energized in said readout devices to provide a different visual numerical indication of shaft position and TV channel selection at each position of the shaft.

3,932,868
ALARM BUZZER DEVICE

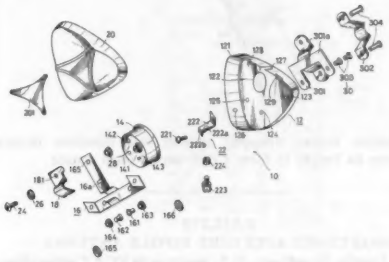
Hisashi Saitou, Kasugai, Japan, assignor to Kabushiki Kaisha Saikosha Seisakusho, Kasugai, Japan

Filed Sept. 9, 1974, Ser. No. 504,419

Claims priority, application Japan, Mar. 13, 1974, 49-28835

Int. Cl.² G08B 3/00

U.S. Cl. 340—384 R **4 Claims**



1. An alarm buzzer device comprising a housing, a buzzer element accommodated in said housing, a battery for actuating said buzzer element, means for holding the battery, a resilient contact arm mounted insulatingly on said buzzer element, a lead wire for connecting the anode side of said battery holder to the input side of said buzzer element, another lead wire for connecting the cathode side of said battery holder to said resilient contact arm, a cover member for covering said housing and arranged floatingly by said resilient contact arm, and engaging means for detachably engaging said cover member with said housing, said engaging means comprising claws formed stationary on said housing, a movable claw operable from outside said housing, and blind holes formed in side walls of said cover member to each loosely engage with each of said claws.

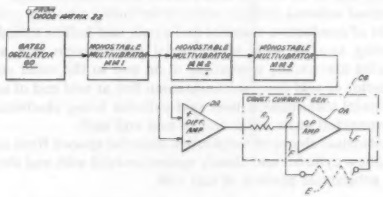
3,932,869
TACTILE NUMERIC DISPLAY DEVICE

Gabriel Kane, Manhattan College, Manhattan College Parkway, Bronx, N.Y. 10471

Continuation-in-part of Ser. No. 420,956, Dec. 3, 1973, abandoned. This application Oct. 11, 1974, Ser. No. 513,995

Int. Cl.² G08B 1/00

U.S. Cl. 340—407 **3 Claims**



1. A tactile numeric display apparatus comprising: a panel of insulating material; a plurality of sets of four electrical conductor pairs, the four electrical conductor pairs of each set being disposed in said panel of insulating material at the corners of quadrilaterals to simulate abbreviated Braille representation of Arabic numerals, each of the electrical conductor pairs including a central conductor having a diameter of from 3/64 to ⅛ inch, and a surrounding concentric annular conductor having a width of from 1/32 to 1/16 inch, with the separation of the conductors of the pair being from 3/64 to ⅛ inch, and the operative area of the central conductor being no greater than one-fourth of the operative area of the said annular conductor, each of the conductors of each electrical conductor pair having at least one end extending beyond one of the surfaces of said panel so that it can be touched by a user; a pulse generator means including a plurality of constant current sources, each of said constant sources having an input and an output connected to one of said pairs of electrical conductors, a plurality of bipolar waveform generators, each of said bipolar waveform generators having an input and an output connected to the input of one of said constant current sources, respectively, each of said bipolar waveform generators when activated generating from 20 to 250 pulse pairs per second, wherein each pair comprises a positive pulse of from 0.1 to 1 millisecond duration and a negative pulse of from 0.1 to 1 millisecond duration with a time interval between the positive and negative pulses of each pair being equal to the duration of one of said pulses and the peak to peak amplitude from the positive pulse to the negative pulse being such that the peak to peak current flowing from said constant current sources is between 0.5 and 10 milliampere; and means for selectively energizing said bipolar waveform generators in accordance with the Arabic numerals to be displayed.

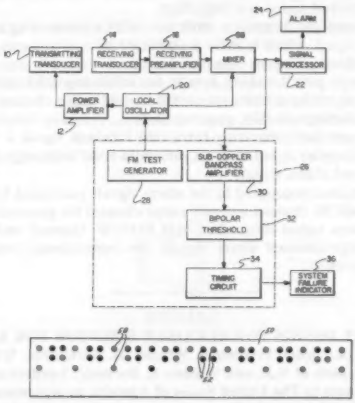
3,932,870
ON-LINE TEST CIRCUIT FOR INTRUSION ALARM SYSTEMS

L. Dennis Shapiro, Lincoln, and Aaron A. Galvin, Lexington, both of Mass., assignors to American District Telegraph Company, New York, N.Y.

Filed May 31, 1974, Ser. No. 475,057

Int. Cl.² G08B 29/00

U.S. Cl. 340—411 **10 Claims**



1. For use in a Doppler intrusion alarm system having means for transmitting energy into a surveillance zone, means for receiving energy returned from said zone and from objects therein, and means for detecting the presence of a moving intruder in said zone, circuitry for the continuous on-line monitoring of system operability comprising:

means for providing an FM test signal to said transmitting means to cause provision of a varying energy pattern in said surveillance zone having difference frequencies below the Doppler band of said system;

means coupled to said receiving means for detecting a sub-Doppler signal derived from said energy returned from said zone and from objects therein; and

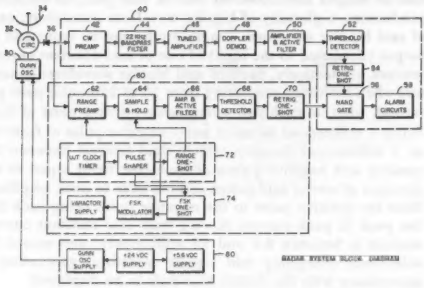
means for providing an output indication of system failure in the event that said sub-Doppler signal does not exceed a predetermined reference threshold.

3,932,871

FM/CW SURVEILLANCE RADAR SYSTEM WITH RANGE GATING

Owen L. Foote, Salt Lake City, Utah, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 11, 1972, Ser. No. 288,177
Int. Cl.² G01S *9/02*, *9/42*; G08B *13/22*
U.S. Cl. 343—5 PD **10 Claims**



1. An FM/CW surveillance radar system with range gating, comprising:

an antenna for continuously transmitting a transmitted signal and for receiving a received signal;

an FM/CW channel coupled to said antenna for receiving said received signal and including means for converting from said received signal a doppler signal above a threshold level to an FM/CW channel alarm signal;

a range channel coupled to said antenna for receiving said received signal and including:

means for frequency shift key (FSK) processing a CW signal, which is to be transmitted by said antenna, only during a range blanking period;

range gate blanking means for inhibiting said received signal from being processed by said range channel only during said FSK process; and,

means for converting from said received signal a range doppler signal above a threshold level to a range channel alarm signal;

alarm means coupled to the alarm signals generated by said FM/CW channel and said range channel for generating an alarm signal only when said FM/CW channel and said range channel alarm signals are concurrently coupled thereto.

3,932,872

CORE DESIGN FOR FLEXIBLE H-SENSOR FOR ELF

Joseph A. Zenel, Princeton; William G. McGuffin, Willingboro, both of N.J., and William E. Barnette, Levittown, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 23, 1974, Ser. No. 535,259
Int. Cl.² H01Q *7/08*
U.S. Cl. 343—788 **7 Claims**

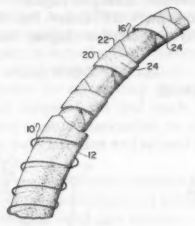
1. A magnetic-core, flexible, H-plane sensor for ELF communications comprising:

small-circumference, longitudinal insert means;

first ribbon means of magnetic material wound in a clockwise fashion down the length of said insert means;

second ribbon means of magnetic material wound in a counterclockwise fashion down the length of said insert means so that said first and second ribbon means cross each other at a plurality of good-mechanical-contact points down the length of said insert means;

insulation means wrapped around said first and second ribbon means down the length of said insert means so that said ribbon means are insulated from the outer environment; and



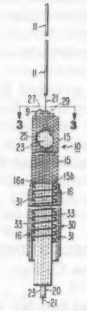
conductor means wrapped around said insulator means down its length to form a distributed-loop sensor.

3,932,873

SHORTENED APERTURE DIPOLE ANTENNA

Arthur Garcia, Woodbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 20, 1974, Ser. No. 507,708
Int. Cl.² H01Q *9/16*
U.S. Cl. 343—792 **7 Claims**



1. A center fed dipole antenna adapted to operate over a given range of frequencies comprising:

a coaxial transmission line,

a first antenna radiator element connected at one end thereof to the inner conductor of said coaxial transmission line at an end of said coaxial transmission line,

a second antenna radiator element including a hollow cylinder of conductive material and a coil, said hollow cylinder being coaxial with said coaxial transmission line and being electrically connected at an end to the outer conductor of said coaxial transmission line at said end of said coaxial transmission line, said cylinder being electrically connected at its other end to said coil and

a cylindrical sleeve of conductive material spaced from said hollow cylinder and closely spaced coaxial with and about a substantial portion of said coil.

3,932,874

BROADBAND TURNSTILE ANTENNA

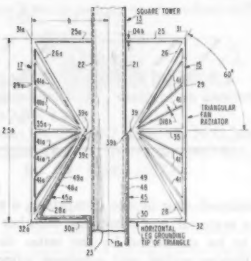
Oakley McDonald Woodward, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 11, 1974, Ser. No. 505,085
Int. Cl.² H01Q *21/26*
U.S. Cl. 343—795 **8 Claims**

1. A turnstile antenna system comprising:

a vertical tower of reflective material,

four triangle-shaped radiating elements extending horizontally from said tower at 90° intervals, each radiating element being mounted to said tower with two sides of the triangle extending from an apex near the tower to a base parallel and remote from said tower, whereby said radiating element has a minimum height at the feed point near the tower and a height that increases linearly to a maximum at said base remote from said tower,



each of said radiating elements being supported to the tower by a conductive support member connecting the radiating element at or near said base to said tower, and

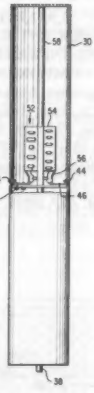
means for feeding equal signal energy to the feed points of said radiators in the relative phase rotation of 0°, 90°, 180° and 270°. .

3,932,875

DIRECTIONAL ANTENNA

John R. Cooney, Friendship St., Waldoboro, Maine 04572

Filed May 13, 1974, Ser. No. 469,535
Int. Cl.² G01S 5/02
U.S. Cl. 343—820 2 Claims



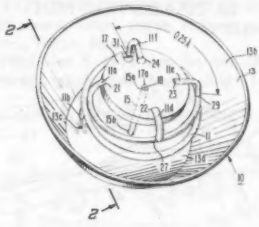
1. A radio direction finding antenna for receiving vertically polarized wave signals comprising a conductive cylindrical element of one half wavelength in length, a mounting staff connected to said element, discrete signal pickup means spaced about the internal-periphery of said cylindrical element, circuit means including a printed circuit board mounted within said element and coupled to said pickup means for relating said signals into directional information based on the phase displacement of the signals at the spaced pickup points and a coaxial cable routed through said mounting staff and coupled to said circuit means.

3,932,876

SHORT END-FIRE CIRCULARLY POLARIZED ANTENNA

Oded Ben-Dov, Medford, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 9, 1974, Ser. No. 496,361
Int. Cl.² H01Q 1/36
U.S. Cl. 343—895 9 Claims



1. An end-fire helical antenna comprising:

a funnel-shaped, electrically conductive reflector having a base at one end and tapering sides to a larger aperture at the opposite end,

a helical coil extending in an axial direction from a fixed point near the base of the reflector to the plane of the aperture, said helical coil having a given diameter and pitch such that one turn equals approximately one wavelength at an operating frequency of said antenna,

a flat conductive plate connected to the aperture end of said helical coil, and

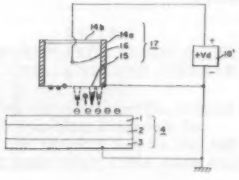
means for conductively mounting said flat plate to said funnel-shaped reflector.

3,932,877

ELECTROPHOTOGRAPHIC RECORDING SYSTEM WITH PLATE CLEANING

Masaru Ohnishi, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed July 2, 1974, Ser. No. 485,079
Claims priority, application Japan, July 4, 1973, 48-75485
Int. Cl.² G03G 15/16; H05F 3/06
U.S. Cl. 346—74 P 9 Claims



1. An electrophotographic recording system comprising

means for forming a charge image of specific polarity on an electrophotographically sensitive plate,

means for transferring the charge image to a recording paper, and

means for neutralizing the residual charge on the electrophotographically sensitive plate comprising a shielding type charge eraser comprising

means for generating a corona discharge producing an electric field and a large number of ions,

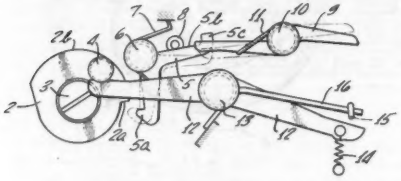
means for shielding the electric field from the residual charge and permitting only ions of a polarity opposite to the residual charge to be disposed adjacent to the electrophotographically sensitive plate, the ions of a polarity opposite to the residual charge being attracted by the residual charge to neutralize the residual charge.

3,932,878

FILM WINDING AND SHUTTER RELEASE ERROR PREVENTION APPARATUS

Hiroshi Kurei, Kawagoe, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 20, 1974, Ser. No. 481,463
Claims priority, application Japan, June 26, 1973, 48-75096[U]
Int. Cl.² G03B 19/12, 17/38
U.S. Cl. 354—153 8 Claims



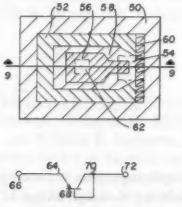
1. A combination film winding and shutter release error prevention device for use in a single lens reflex camera with a swingable mirror, said device comprising:
a film winding mechanism;
a shutter button;
an arresting lever interconnecting said film winding mechanism with said shutter button;
guide means connected to said film winding mechanism; and
adapter means connected to said shutter button, said arresting lever pivotally mounted between said guide means and said adapter means, said arresting lever automatically preventing movement of said shutter button before said film winding operation is completed.

3,932,879

BILATERALLY CONDUCTING ZENER DIODE AND CIRCUIT THEREFOR

Wilson David Pace, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed July 17, 1974, Ser. No. 489,191
Int. Cl.² H01L 29/90, 29/06, 29/747; H02H 7/06
U.S. Cl. 357—13 5 Claims



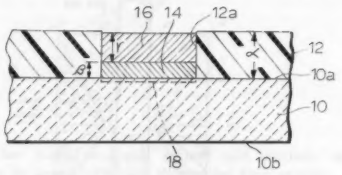
1. A bilaterally conducting zener diode, comprising:
a semiconductor body of a first conductivity type,
an anode region positioned within said semiconductor body and being of an opposite conductivity type;
a cathode region positioned within said body and being of said first conductivity type and forming a P-N junction with said anode region; and
a further region of opposite conductivity type surrounding said anode region and spaced close to said cathode region for collecting the current flowing out of said anode region and contact means for returning such current to the cathode region.

3,932,880

SEMICONDUCTOR DEVICE WITH SCHOTTKY BARRIER

Aiichiro Nara; Hisao Kondo; Masatoshi Mizushima, and Fumi Moriai, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1974, Ser. No. 527,427
Claims priority, application Japan, Dec. 1, 1973, 48-13593
Int. Cl.² H01L 29/46, 29/48
U.S. Cl. 357—15 13 Claims



1. A semiconductor device comprising a substrate of semiconductive material, and a metallic member disposed on said substrate to be contacted by the latter thereby to form a Schottky barrier within said substrate adjacent that protion thereof contacted by said metallic member, said metallic member being composed of a nickel-palladium alloy.

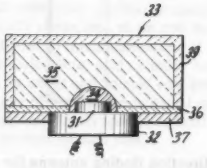
10. A semiconductor device comprising a substrate of semiconductive material including a pair of first and second main faces opposite to each other, a surface passivation film of electrically insulating material disposed so as to cover that portion of said first main face of said substrate except for a predetermined portion thereof, a first metallic layer formed of a nickel-palladium alloy and disposed so as to contact said predetermined portion of said first main face of said substrate thereby to form a Schottky barrier in said substrate adjacent that portion thereof contacted by said first metallic member, and a second metallic layer disposed to cover said first metallic layer, the sum of the thickness of said first and second metallic layers not exceeding the thickness of said surface passivation film.

3,932,881

ELECTROLUMINESCENT DEVICE INCLUDING DICHROIC AND INFRARED REFLECTING COMPONENTS

Yoh Mita, and Eiji Nagasawa, both of Tokyo, Japan, assignors to Nippon Electric Co., Inc., Tokyo, Japan

Continuation of Ser. No. 393,490, Aug. 31, 1973, abandoned.
This application Mar. 7, 1975, Ser. No. 556,446
Claims priority, application Japan, Sept. 5, 1972, 47-89333; Nov. 21, 1972, 47-117437
Int. Cl.² H01L 33/00
U.S. Cl. 357—17 4 Claims



1. A light emitting device comprising:
diode means for emitting first infrared radiation;
a single crystal of luminescent material excitable in a step-like manner by said infrared radiation attached to said diode means for emitting visible radiation together with second infrared radiation having a wavelength range in common with said first infrared radiation, said luminescent material being sensitized by ytterbium ions; and

a closed optical cavity comprising, in turn, a dichroic filter disposed in front of said diode means that is transparent to said visible radiation but reflects said first and second infrared radiation and a reflector that extends behind said diode means as a back wall of the cavity and reflects said first and second infrared radiation, said cavity thereby confining said first and second infrared radiation therein and emitting only said visible radiation through said dichroic filter, whereby the excited state lifetime of said ytterbium ions is made as long as about four milliseconds.

3,932,882

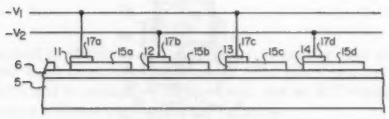
CHARGE TRANSFER DEVICE

Josef Berger, Sunnyvale, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 370,887, June 18, 1973, abandoned. This application Oct. 24, 1974, Ser. No. 517,717

Int. Cl.² H01L 29/78

U.S. Cl. 357—24 6 Claims



1. A semiconductor charge transfer device comprising:

a substrate layer of a semiconductor material;

an insulating layer of an insulating material on the substrate layer; and

an array of electrodes positioned on the insulating layer with an electrically insulating gap between adjacent electrodes, each electrode comprising a first part of a highly conductive material, and a second part of a highly resistive material, the highly resistive part and an associated portion of the insulating layer forming a distributed RC delay line for delaying the response time of an associated region of the substrate to changes in electrical potentials applied to the electrodes, the resulting variation of electrical potential in the substrate serving to impart dynamic directionality to the transfer of charge in said device.

3,932,883

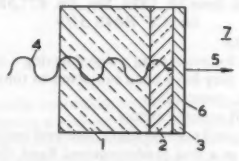
PHOTOCATHODES

Michael Charles Rowland, Royston, and David Robert Wight, Hitchen, both of England, assignors to The British Secretary of State for Defense, London, England

Continuation of Ser. No. 278,834, Aug. 8, 1972, abandoned. This application June 24, 1974, Ser. No. 482,700

Int. Cl.² H01L 29/161, 33/00, 27/14, 29/20

U.S. Cl. 357—30 6 Claims



1. A transmission photocathode comprising:

an activated detector layer of p-type gallium arsenide of thickness less than the electron diffusion length in gallium arsenide,

a crystalline substrate of gallium phosphide having an energy band gap greater than that of said gallium arsenide detector layer, and

a p-type intermediate layer selected from the group consisting of $Ga_{(1-x)}Al_xAs$, where $o<x\leq 1$, and $Ga_{0.5}In_{0.5}P$, said detector layer being epitaxially supported upon said intermediate layer, and said intermediate layer being supported upon said substrate.

3,932,884

MIS TYPE INTEGRATED CIRCUIT DEVICE

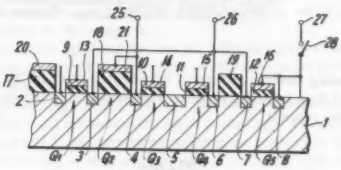
Yoshishige Kitamura, Tokyo, Japan, assignor to Nippon Electric Co., Inc., Tokyo, Japan

Filed Mar. 5, 1974, Ser. No. 448,258

Claims priority, application Japan, Mar. 14, 1973, 48-30301

Int. Cl.² H01L 27/02, 29/78; H03K 3/353

U.S. Cl. 357—41 5 Claims



1. A metal-insulator-semiconductor integrated circuit device comprising a semiconductor substrate of a first conductivity type, a plurality of metal-insulator-semiconductor transistors each having regions of a second conductivity type opposite to the first forming a source and a drain on a major surface of said substrate, means for grounding a first portion of said regions belonging to one of said transistors, means for applying a voltage to a second region belonging to a different one of said transistors, said first and second regions being disposed in such relationship that a leakage current flows between them if the absolute potential of said semiconductor substrate exceeds a first predetermined value, and means for clamping the potential of said semiconductor substrate at a second predetermined value closer to the ground potential than said first value predetermined to prevent said substrate from exceeding said first predetermined value, said clamping means being connected between the ground potential and said substrate.

3,932,885

SYSTEM AND METHOD FOR XENON ACCELERATION IN TRAINING SIMULATOR FOR NUCLEAR POWER PLANT

Francis R. Czerniejewski, Glenshaw, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 23, 1973, Ser. No. 335,287

Int. Cl. G06f 15/06, 15/56; G06b 9/00

U.S. Cl. 444—1 15 Claims

1. An automated training simulator for the real-time dynamic operation of a nuclear reactor in which the power output of the reactor is influenced by xenon over an extended period of time; said simulator comprising

a control console having command devices operable to generate input data values

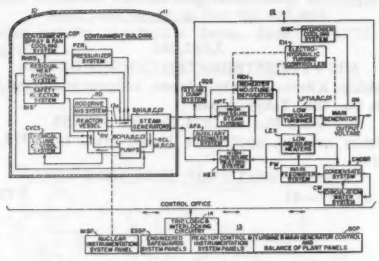
calculating means including sequence controlling means having the following components

a. first means to generate a data value relating to reactor power output in accordance with a data value relating to nuclear flux,

b. second means to generate a data value relating to xenon concentration in accordance with the generated reactor power data value,

c. third means to generate a data value relating to neutron absorption in accordance with the generated xenon concentration data value,

d. fourth means to generate said data value relating to nuclear flux in accordance with the generated neutron absorption data value and the input data values; and



indicating devices governed by selected ones of the generated data values to monitor the operation of the representative reactor.

3,932,886

METHOD AND APPARATUS FOR MIXING AND RECORDING MULTI-TRACK STEREO AUDIO SIGNALS WHICH HAVE BEEN RECORDED AS SEVERAL INDIVIDUAL AUDIO SIGNALS

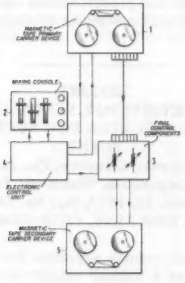
Karl-Adolf Olms, London, England, and Rolf Schmidt, Hannover, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 311,004, Nov. 30, 1972, abandoned, Continuation-in-part of Ser. No. 101,469, Dec. 28, 1970, abandoned. This application Feb. 25, 1974, Ser. No. 445,570

Claims priority, application Germany, Jan. 14, 1970, 2001493

Int. Cl.² G11B *27/02, 31/00*

U.S. Cl. 360—13 **10 Claims**



1. A method of producing a single composite sound recording from recordings of a plurality of subsidiary audio signals individually recorded on separate tracks of a multi-track primary carrier to provide a number of output channels which is less than the number of subsidiary audio signals, comprising the steps of reading the subsidiary audio signals from the primary carrier, mixing the subsidiary audio signals, contemporaneously with said mixing varying control elements assigned to the subsidiary audio signals to vary acoustic characteristics of said audio signals including level and frequency response, sampling during scanning cycles controlled by synchronizing pulses the positions of the control elements in succession to obtain the varied quantities as analog values, converting the sampled values into digital pulse trains which correspond to the respective control elements, recording the digital pulse trains in succession during recurrent cycles on at least one additional track of the multi-track primary carrier which contains the recordings of the subsidiary audio signals, and recording the mixed audio signals on a second carrier having said number of output channels.

3,932,887

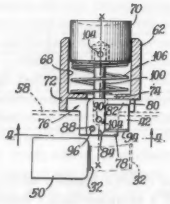
TAPE MARKER

John P. Jenkins, Towanda, Ill., assignor to International Tapetronics Corporation, Bloomington, Ill.

Filed July 18, 1974, Ser. No. 489,615

Int. Cl.² G11B *27/02*

U.S. Cl. 360—13 **5 Claims**



1. In a tape reproducing machine, a tape trained for movement past a reproducing head in a housing compartment having an opening through which said tape is inserted into and withdrawn from playing position against said head, a tape marker comprising:

a tape marking arm having an inked marking pad, said tape marking arm being pivotally mounted on the housing on a pivot axis laterally offset from one edge of of the tape when in said playing position for swinging movement between a marking position against the tape at the center of the reproducing head, and a stored, out-of-the-way position laterally of said edge of the tape providing open clearance for tape while being inserted through said housing compartment opening along a line of direct approach to the face of the reproducing head, and pushbutton means for actuating said tape marking arm.

3,932,888

APPARATUS FOR MODIFYING THE TIME BASE OF SIGNALS

James U. Lemke; Robert A. Lentz, both of Del Mar, and Charles E. Wright, Solana Beach, all of Calif., assignors to Eastman Technology, Inc., Rochester, N.Y.

Filed June 10, 1974, Ser. No. 477,583

Int. Cl.² H04N *5/79*

U.S. Cl. 360—36 **10 Claims**

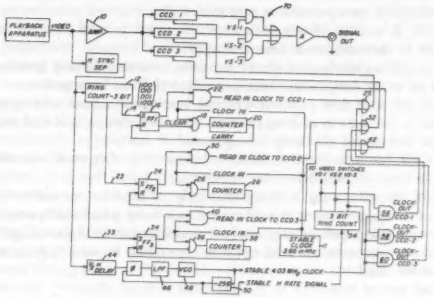
1. Apparatus for processing a signal having a nominal duration and which may have been subjected to time-wise stretch or compression, comprising:

a. analog shift register means,

b. means for clocking said signal into said analog shift register means at a first predetermined fixed clock rate, said fixed rate being sufficient to load all stages of said analog shift register means with samples of, and within the duration of, said signal when said signal has been subjected to time-wise stretch of a predetermined amount, whereby said analog shift register means may be loaded from its output end toward its input end with a number of signal samples that correspond with the degree of time-wise stretch or compression of said signal,

c. means for producing an enabling signal, and

d. means responsive to said enabling signal for clocking said signal samples out of said analog shift register means at a



second predetermined fixed clock rate greater than said first fixed clock rate, said second fixed clock rate being sufficient to unload all stages of said analog shift register means within a predetermined duration.

3,932,889

MAGNETIC RECORDING AND REPRODUCING SYSTEM HAVING AN AUTOMATIC TAPE DRIVE CONTROL FUNCTION

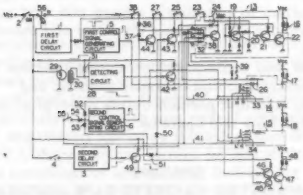
Kiyoshi Takeda, Neyagawa, and Toshiomi Yabu, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 24, 1973, Ser. No. 409,096

Claims priority, application Japan, Oct. 27, 1972, 47-108136; Oct. 27, 1972, 47-108137; Oct. 27, 1972, 47-108138; Oct. 27, 1972, 47-108139; May 10, 1973, 48-55138[U]

Int. Cl.[2] G11B *15/18, 15/66*

U.S. Cl. 360—71 **6 Claims**



1. A magnetic recording and reproducing system using a cartridge housing a reel on which is wound a magnetic tape having a transparent leader tape joined at a leading end thereof and a transparent trailing tape joined at a trailing end thereof, comprising:

a. cartridge holding means for mounting said cartridge for movement between an operative position and an inoperative position on the system and including an ejection means having an ejecting solenoid (48) for moving said cartridge from the operative position to the inoperative position;

b. a take-up reel provided on the system;

c. loading means including a pinch roller for transporting the tape over a travel path from said cartridge to said take-up reel responsive to the movement of said cartridge to the operative position;

d. first delay means (1) for producing an output voltage signal after a delay time corresponding to the time the leader tape is transported from said cartridge by said loading means to the time the magnetic tape passes through the pinch roller;

e. a first control circuit means (43) for inverting an input signal;

f. first switching means (56) for applying a supply voltage to said first control circuit means (43) through said first delay means when the tape is transported by said loading means and directly to said first control circuit means (43) when the tape is not transported by said loading means;

g. first and second pulse generating means (5, 6). each generating a pulse at the beginning of a voltage signal applied to their inputs;

h. means for applying the output voltage signal of said first delay means (1) to the input of said first pulse generating means (5);

i. a rewinding solenoid (16), a playback soleniod (17) and a fast feed solenoid (18) each including a holding circuit means (13, 14, 15) for energizing the respective solenoid and having a set terminal and a reset terminal wherein once an input signal is supplied to the set terminal, a fixed state of the set terminal is maintained energizing the respective solenoid until a next signal is supplied to the reset terminal, and when one of the holding circuit means is set, the others are reset;

j. a tape rewinding means activated by said rewinding solenoid (16);

k. a playback means activated by said playback solenoid (17);

l. a tape fast feed means activated by said fast feed solenoid (18);

m. means for supplying the pulse of said first pulse generating means (5) to the set terminal of the holding circuit means of said playback solenoid (17);

n. first detecting means (29, 30) arranged in the travel path of said magnetic tape for detecting the presence and absence of said magnetic tape and generating an output signal in the absence of said magnetic tape;

o. means for passing the output signal of said first detecting means to the reset terminal of said holding circuit means of said playback solenoid and said fast feed solenoid, and as the input signal to said first control circuit means, said control circuit means including means for applying the inverted signal to the set terminal of said holding circuit means of said rewind solenoid;

p. means for applying said output signal of said first detecting means (29, 30) as the voltage signal applied to the input of said second pulse generating means (6);

q. means for applying the pulse of said second pulse generating means (6) to the reset terminals of all of said holding circuit means (13, 14, 15);

r. tape end second detecting means (4), including an indicator scale means which increases depending on the quantity of tape feed and decreases depending on the quantity of tape rewind, for providing an output signal at the zero point of said indicator scale means;

s. a second delay means (3) for delaying said output signal of said tape end detecting means and providing an output signal;

t. means for applying the output signal of said second delay means to the reset terminal of said holding circuit means of said rewind solenoid;

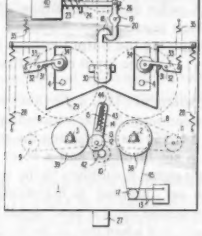
u. means (45, 46) for ANDing the output signals of said second delay means, said first detecting means and the pulse of said first pulse generating means and providing an output signal; and

v. means for energizing the ejecting solenoid (48) in response to the ouput signal of said ANDing means.

3,932,890
DEVICE FOR ELIMINATING TAPE SLACK IN A MAGNETIC TAPE RECORDING AND REPRODUCING APPARATUS

Yoshiharu Ueki; Yoshio Maruyama; Yoshihiro Magata; Akihiro Fushimi, and Katsuhisa Shimizu, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 22, 1974, Ser. No. 453,895
Claims priority, application Japan, Mar. 24, 1973, 48-33974
Int. Cl.² G11B *21/02*, *15/43*, *5/54*
U.S. Cl. 360—75 **6 Claims**



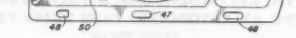
1. In a tape recording and reproducing device of the type having rotatable supply and take-up spindles engaging tape supply and take-up reels, at least one capstan, means to rotate said supply spindle in a reverse direction, at least one pinch roller selectably engageable with said capstan, a motor driven means to rotate said at least one capstan for feeding the tape in a forward direction when said at least one pinch roller is engaged with said at least one capstan, a movable carriage having a transducer head and means to control the engagement of said at least one pinch roller with said capstan mounted thereon and mounting means to mount said carriage so as to be movable between a first position wherein said transducer head and said at least one pinch roller are out of contact with said tape and said at least one capstan respectively, and a second position wherein said transducer head and said at least one pinch roller are in contact with said tape and said at least one capstan, respectively, the improvements comprising:
   a. means to rotate said take-up spindle in a forward direction so as to wind the tape thereon by running the motor in a forward direction,
   b. means for sensing the rotation of the supply spindle in the forward direction, and
   c. means responsive to said activation of the forward spindle drive and forward rotation of said supply spindle to move the carriage to the second position so as to engage the transducer head with the tape and bring said at least one pinch roller in contact with said at least one capstan.

3,932,891
MAGNETIC TAPE PLAYER WITH CARTRIDGE DOOR OPENING MEANS

Emory Horvath, 7065 Overbrook Drive, Longmont, Colo. 80501

Filed June 10, 1974, Ser. No. 474,778
Int. Cl.² G11B *23/10*; B65H *17/48*
U.S. Cl. 360—93 **14 Claims**

1. In sound reproducing apparatus for use with magnetic tape cartridges, the apparatus embodying means for receiving such a cartridge in operative position therein, a transducer head, and drive means including a member which is rotatable during operation of said drive means, the combination of
   a. a cartridge insertable into and removable from said operative position,
   b. said cartridge comprising
      1. a housing having
         a. an end wall, and
         b. an aperture in said end wall
      2. a strip of magnetic tape mounted in said housing for movement across said aperture,
      3. an elongated panel movably mounted in said housing for longitudinal reciprocation therein between
         a. a first position wherein it extends across said aperture in closing relation thereto between said end wall and said strip of tape, and
         b. a second position wherein it is disposed laterally outwardly of said aperture,
      4. means for holding said strip of tape in operative engagement with said transducer head when said panel is disposed in said second position and said cartridge is disposed in said operative position in said apparatus, and



      5. means for holding said tape against said rotatable member for movement thereby across said aperture and said transducer head, during operation of said drive means, when said panel is disposed in said second position and said cartridge is disposed in said operative position in said apparatus, and
   c. means for reciprocating said panel between said first position and said second position,
   d. said last mentioned means comprising
      1. a first actuating member operatively connected to said panel, and
      2. a second actuating member mounted in said apparatus in position to operatively engage said first actuating member for reciprocating the latter and thereby said panel,
         a. into said second position during insertion of said cartridge into said operative position, and
         b. into said first position during removal of said cartridge from said operative position.

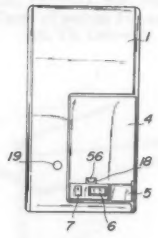
3,932,892
SUPERMINIATURE CASSETTE TAPE RECORDER

Shoichi Saito, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1972, Ser. No. 319,859
Claims priority, application Japan, Dec. 29, 1971, 47-180
Int. Cl.² G11B *23/06*
U.S. Cl. 360—96 **5 Claims**

1. A superminiature cassette tape recorder comprising a flat elongated upper casing; a flat elongated lower casing; an intermediate frame held between said upper and lower casings and having fittings mounted thereon and adapted to mount thereon electrical components; a chassis secured to said intermediate frame and supporting a tape driving mechanism and tape operating members such as record-reproduction, fast-feed and rewind operating members; a printed circuit mounted on said intermediate frame and constituting an electric circuit; a sliding plate slidably mounted on said chassis for movement along an L-shaped passage and having a record-

reproduction magnetic head mounted thereon; and a lever plate pivotally secured at its one end to said chassis and having a leaf spring secured at its one end to said lever plate, said lever plate having a manually operable first projection for raising a cassette mounted on said chassis, a second projection penetrating beneath said leaf spring and for raising it together with said lever plate against its spring action, and a third projection adapted to be engaged with the lower end of said sliding plate in the recording-reproducing, fast-feeding and rewinding modes of operation of the tape recorder so as to prevent the cassette from being removed; in which the improvement comprises, said tape operating members, a ball resiliently supported by chassis and partially projected upwards through a gourd-shaped hole formed on said sliding plate, said ball being clicked into a circular hole formed at a position on said sliding plate above said gourd-shaped hole upon said sliding plate being moved downwards and clocked into the right side hole portion of said gourd-shaped hole upon said sliding plate being moved leftwards, thereby maintaining said sliding plate at the position thus moved; a rotatable switch button pivotally secured substantially at its center to one face of said chassis so as to be rotatable in a direction perpendicular to the side edge of casing and selectively assume a recording-reproducing position, a rewinding position, and a stopping position; a lever pivotally secured to said chassis and having an erasing head and a projection; a record push button slidably secured to an intermediate plate and having a projection adapted to be engaged with said projection of said lever when said push button is not depressed and disengaged therefrom when said push button is depressed; a pin secured to a further lever pivotally secured to one end of said rotatable switch button and slidably extending through a rearwardly faced and inclined L-shaped groove formed on said sliding plate and a groove composed of an upwardly inclined leg and a downwardly inclined leg integrally joined at their centers with a common short horizontal leg formed on said chassis; a fast-feed button secured to a lever slidably mounted on the opposite face of said intermediate frame and engaged with said groove, said fast-feed push button biased upwards and engageable at its lower end with said projection of said record push button in a manner such that when said record push button is depressed the fast-feed push button is prevented from being depressed; and a switch having four resilient conductive contact pieces arranged in parallel to each other and each secured at its lower end to an insulated board fastened to said slidable lever, said contact pieces constituting two switch contacts adapted to selectively connect a capstan shaft driving motor to two electric circuits, one for driving said motor at a constant speed and the other for driving said motor at a high speed, said two switch contacts being selectively opened and closed by said pin secured to one end of said rotatable switch button and a pin secured to said fast-feed push button.



3,932,893

SOUND RECORDING AND REPRODUCING APPARATUS

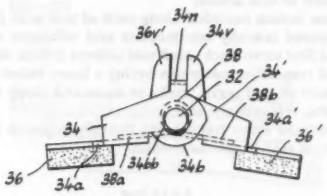
Franz Singer, Munich, Germany, assignor to Compur-Werk Gesellschaft, Munich, Germany

Filed Sept. 30, 1974, Ser. No. 510,759

Claims priority, application Germany, Oct. 23, 1973, 2353021

Int. Cl.² G11B *15/60*

U.S. Cl. 360—130 **6 Claims**



1. In a tape transport mechanism of the type wherein a tape is moved sequentially along signal heads for the reception or reproduction or removal of informational signals, means for guiding and pressing the tape against the signal heads comprising a mounting pin located between the signal heads and on the opposite side of the tape relative to the signal heads, two like-shaped swinging levers each having two guide flanges by which the levers are pivotally journalled on said mounting pin, each swinging lever having a wing portion extending outwardly from said mounting pin and carrying a pad oriented so as to lie generally opposite a respective one of the signal heads for bearing against the tape opposite a respective one of said signal heads, and torsion spring means engaged about the mounting pin for biasing said swinging levers and their wings in respective directions to press the tape against the signal heads, each swinging lever having an abutment nose and an abutment surface so arranged that the abutment nose of one is biased by said torsion spring against the abutment surface of the other to define normal inoperative positions in which the swinging levers are held by the spring when the wing pads are clear of the signal heads, and such that the abutment noses and surfaces are moved away from each other when the wing pads bear against the signal heads to define the operative positions of the swinging levers.

3,932,894

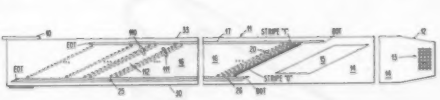
MAGNETIC RECORD MEMBER FOR USE WITH ROTATING HEAD MAGNETIC RECORDING APPARATUS

Nelson K. Arter; Thomas F. Eichhorn, both of Boulder County, and Clement H. Kalthoff, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 14, 1974, Ser. No. 451,270

Int. Cl.² G11B *5/78, 21/04, 23/36, 23/40*

U.S. Cl. 360—134 **8 Claims**



1. A new article having a flexible longitudinally elongate substrate having a magnetic coating substantially over its longitudinal length and a pair of longitudinal edges, one of which is a reference edge, a leader end and a spool end,

the improvement including in combination:

first and second laterally spaced-apart longitudinally extending servo tracks each consisting of a longitudinal extending series of record area designating signals sensi-

ble along respective scan paths, corresponding signals of said servo tracks defining transverse ends of a recording area adapted to receive data signals serially arranged along said scan paths extending along said corresponding signals, respectively;

each said scan path subtending an acute angle with respect to said reference edge and opening toward said leader end;

said first servo track being laterally spaced from said reference edge a distance less than one-fourth the lateral extent of said article;

address indicia recorded along each of said scan paths and disposed laterally intermediate said reference edge and said first servo track, each said address indicia identifying said respective scan paths having a lesser extent than the extent of said servo tracks as measured along said scan paths, respectively; and

said second servo track being laterally adjacent a second one of said longitudinal edges.

3,932,895

REVERSIBLE MAGNETIC RECORDING DISK UNIT

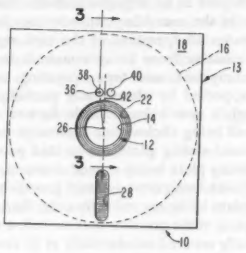
Paul F. Ward, San Jose, Calif., assignor to Information Terminals Corporation, Sunnyvale, Calif.

Filed Sept. 10, 1974, Ser. No. 504,792

Int. Cl.² G11B *5/82, 5/012, 23/02*

U.S. Cl. 360—135 **4 Claims**

4. A jacket for a reversible magnetic recording disk having a magnetic coating on each of the opposed faces thereof, said jacket including a pair of flexible opposed sides having means for connecting the outer peripheral margins thereof together when the disk is therebetween and rotatable relative thereto, each side having a central circular opening, a slot extending radially from and being in spaced relationship to the central opening, a pair of spaced holes symmetrically located on



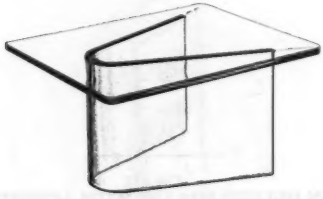
opposite sides of a line coincident to the radial line on which the slot is disposed, the slot and holes of one side being aligned with the slot and respective holes of the other side, and a pair of recesses symmetrically located relative to said radial line and mating with respective recesses of the other side for permitting the reversible mounting of said recording disk contained therein.

DESIGNS

JANUARY 13, 1976

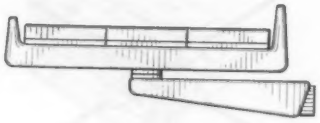
238,403
JACKET
Donald R. Kracke, 5620 Whitecliff Drive, Palos Verdes Peninsula, Calif. 90274
Filed July 10, 1974, Ser. No. 487,146
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—187

238,404
TOY COFFEE TABLE OR SIMILAR ARTICLE
Marion D. Owens, Denver, Colo.
(890 Reed Court, Lakewood, Colo. 80215)
Filed Nov. 13, 1972, Ser. No. 305,902
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—5



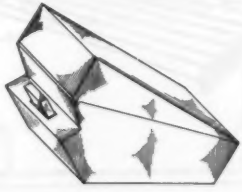
238,405
NECKTIE RACK
Bert Harold Athey, 170 N. Thurston Ave., Los Angeles, Calif. 90049
Filed Mar. 11, 1974, Ser. No. 449,940
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—28

238,406
CANTILEVER MOUNTABLE HOSPITAL BED
Mitchell Bobrick, 835 Hopkins Way, Suite 406, Redondo Beach, Calif. 90034
Filed Nov. 2, 1973, Ser. No. 412,482
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—79

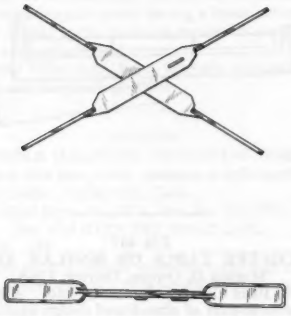


238,407
TOY COFFEE TABLE OR SIMILAR ARTICLE
Marion D. Owens, Denver, Colo.
(890 Reed Court, Lakewood, Colo. 80215)
Continuation-in-part of abandoned design application Ser. No. 169,586, Aug. 5, 1971. This application Nov. 13, 1972, Ser. No. 305,905
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175

238,408
NAPKIN DISPENSER
Adam Pecht, Cudahy, Calif.
(11924 Gurley Ave., Downey, Calif. 90242)
Filed Feb. 19, 1974, Ser. No. 443,914
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—72



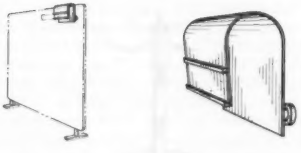
238,409
STAND FOR HOT COOKING UTENSILS
Loren C. Kienlen and Jack H. Poppler, Nisswa, Minn., assignors to Doormaid, Inc., Nisswa, Minn.
Filed Aug. 21, 1974, Ser. No. 499,164
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—130



238,410
CLOTHES DRYER
Heinz Hermann Weick, 94 Rue de la Serveite, 1202 Geneva, Switzerland
Filed Nov. 15, 1973, Ser. No. 416,314
Claims priority, application Switzerland May 15, 1973
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—196

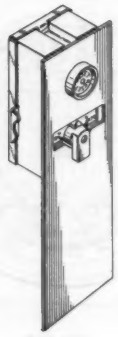
238,411
BOTTLE OPENER
Sol J. Levenson, 2636 S. Belvoir Blvd., University Heights, Ohio 44118
Filed Aug. 23, 1974, Ser. No. 500,042
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D8—18

238,412
SIGN HOLDER FOR USE WITH ACOUSTICAL DIVIDERS
Donald Albert De Mars, 6964 Shoup Ave., Canoga Park, Calif. 91303
Filed Nov. 29, 1974, Ser. No. 528,084
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D8—245



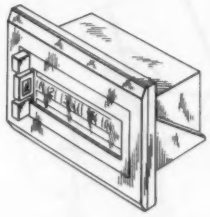
238,413
WRISTWATCH
Julius B. Blanchard, New York, N.Y., assignor to E. Gluck Corporation, New York, N.Y.
Filed Aug. 22, 1974, Ser. No. 499,665
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

238,414
THERMOSTATIC CONTROL UNIT
John W. Stearley, Indiana, Pa., assignor to Robertshaw Controls Company, Richmond, Va.
Filed July 22, 1974, Ser. No. 490,699
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—50

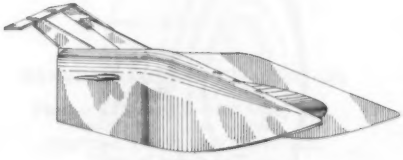


238,415
LEVELING INSTRUMENT
Thomas Midgley III, Los Angeles, and Robert E. Forrester, Camarillo, Calif., assignors to Forrgley, Inc., Los Angeles, Calif.
Filed July 22, 1974, Ser. No. 490,736
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—65

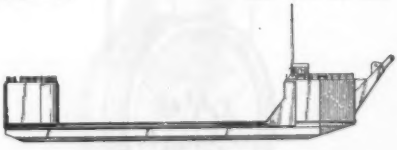
238,416
COUNTER
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Redington Counters, Inc., Windsor, Conn.
Filed May 13, 1974, Ser. No. 469,124
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—97



238,417
SURFACE EFFECT CRAFT
Thomas M. Austin, Fargo, N. Dak., assignor to Austin Aeromarine, Inc., Fargo, N. Dak.
Filed July 25, 1974, Ser. No. 491,747
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—5

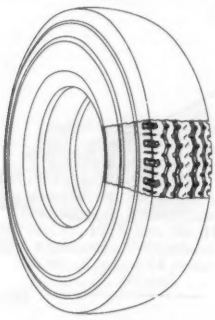


238,418
SEMI-SUBMERSIBLE BARGE
Brian Chang, 8 Tosca St., Seletar Hills, Singapore 16, and James Dolan, 71 Neram Road, Seletar Hills, Singapore 18
Filed Oct. 29, 1974, Ser. No. 518,654
Claims priority, application Great Britain May 17, 1974
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—66

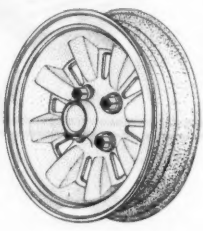


238,419
BICYCLE FRAME
Herman S. Apodaca, P.O. Box 77, Clint, Tex. 79836
Filed July 17, 1973, Ser. No. 380,001
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—111

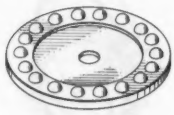
238,420
TIRE
Henri Verdier, Beauregard-L'Eveque, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand, Puy-de-Dome, France
Filed Oct. 26, 1973, Ser. No. 410,082
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



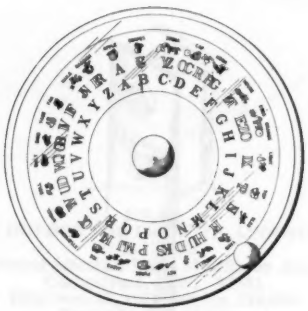
238,421
WHEEL
Randolph J. Wittine, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 8, 1974, Ser. No. 458,770
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



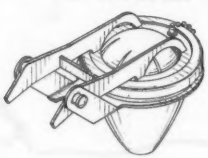
238,422
BICYCLE WHEEL ORNAMENT
Allan C. Stults, 424 Prospect St., Newport Beach, Calif. 92660; Raymond H. Powell, 11871 Simon Ranch Road, Santa Ana, Calif. 92705; and Edward D. O'Brian, 910 Iroquois Ave., Anaheim, Calif. 92801
Filed Apr. 15, 1974, Ser. No. 460,811
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—213



238,423
EDUCATIONAL COLOR WHEEL
Ellis H. Robinson, Bldg. 328, Paine Field, Everett, Wash. 98204
Filed Nov. 26, 1973, Ser. No. 418,888
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—59

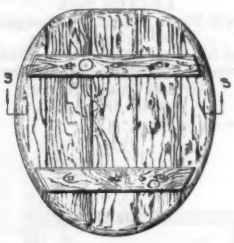


238,424
FLUSH TANK VALVE UNIT
Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631, and Fredric E. Schmuck, 535 Century Drive, Anaheim, Calif. 92805
Filed Aug. 15, 1974, Ser. No. 497,525
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

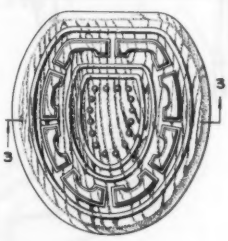


238,425
WATER CLOSET SEAT COVER
David E. Harrison, Columbus, Miss., assignor to Beneke Corporation, Columbus, Miss.
Filed Sept. 5, 1974, Ser. No. 503,913
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71

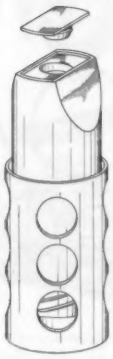
238,426
WATER CLOSET SEAT COVER
David E. Harrison, Columbus, Miss., assignor to Beneke Corporation, Columbus, Miss.
Filed Sept. 5, 1974, Ser. No. 503,914
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71



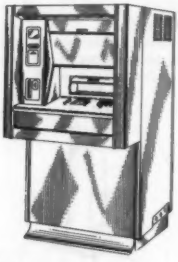
238,427
WATER CLOSET SEAT COVER
David E. Harrison, Columbus, Miss., assignor to Beneke Corporation, Columbus, Miss.
Filed Sept. 5, 1974, Ser. No. 503,915
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71



238,428
AIR FRESHENER OR SIMILAR ITEM
Georg Schimanski, Rummenohl, Germany, assignor to Global-Werk GmbH, Neuburg an der Donau, Germany
Filed Aug. 20, 1974, Ser. No. 498,882
Claims priority, application Germany May 2, 1974
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



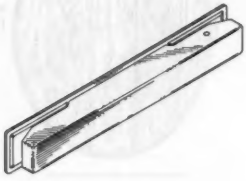
238,429
BANKING MACHINE TERMINAL OR SIMILAR ARTICLE
Thomas L. Hermann, 4540 Selma Pike, Springfield, Ohio 45502
Filed Dec. 3, 1973, Ser. No. 420,928
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



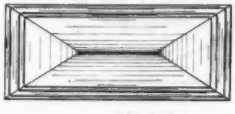
238,430
ANTENNA
Frank Lanson, Woodbury, N.Y., and Milton Spirt, 181—25 Midland Parkway, Jamaica Estates, N.Y. 11442; said Lanson assignor to said Spirt
Filed Apr. 15, 1974, Ser. No. 460,743
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 F

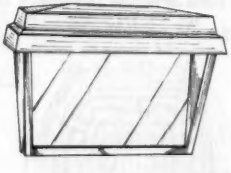
238,431
CIGARETTE LIGHTER CASING
Alfred William Skinner, Epsom, England, and Seymour Rappoport, Rumson, N.J., assignors to Ronson Products Limited
Filed Mar. 5, 1974, Ser. No. 448,213
Claims priority, application Great Britain Sept. 6, 1973
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

238,432
CASKET LOCK HANDLE
Jon W. Hauser II, St. Charles, Ill., assignor to Elgin Metal Casket Company, Elgin, Ill.
Filed Jan. 2, 1974, Ser. No. 429,864
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D31—11



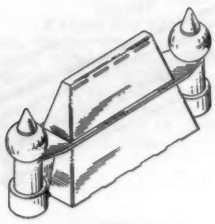
238,433
LETTER BOX
Bertil Thure Johnzon, 8 Hostgatan, 38200 Nybro, Sweden
Filed Mar. 23, 1973, Ser. No. 344,241
Claims priority, application Sweden Oct. 16, 1972
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D31—22



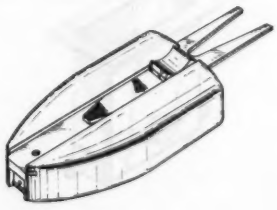


238,434
BALANCING SNAKE FIGURE TOY OR THE LIKE
Evan H. Berlin, 119 Dunn Ave., Lake City, Pa. 16423
Filed July 5, 1973, Ser. No. 376,721
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R

238,435
ROLL-OVER GUIDE FOR PIN BALL MACHINE
Roman F. Garbark, Westchester, Ill., assignor to D. Gottlieb & Co., Northlake, Ill.
Filed Sept. 9, 1974, Ser. No. 504,180
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 JJ

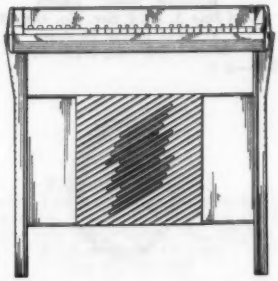


238,436
GOLFER'S MULTI-PURPOSE TOOL
Thomas H. McKelvey, 5195 Rivoli Drive, Macon, Ga. 31204
Filed Jan. 8, 1973, Ser. No. 321,988
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB



238,437
SOUNDING TOY FOR PET ANIMAL
Samuel Rosenberg, Brooklyn, N.Y., assignor to Excelsior Pet Products, Inc., Brooklyn, N.Y.
Filed Apr. 13, 1973, Ser. No. 350,739
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R

238,438
TOY ELECTRIC ORGAN OR SIMILAR ARTICLE
Paolo Bontempi, Via Don Bosco 49, Potenza Picena, Macerata, Italy
Filed June 18, 1973, Ser. No. 371,025
Claims priority, application Italy Dec. 18, 1972
Term of patent 14 years
Int. Cl. D17—*01*; D21—*01*
U.S. Cl. D34—15 C

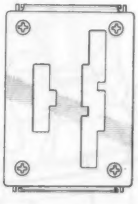


238,439
WATER TOY
Robert K. Ostrander, Rolling Meadows, Ill., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Mar. 3, 1971, Ser. No. 120,790
Term of patent 14 years
The term of this patent subsequent to Sept. 13, 1989, has been disclaimed
Int. Cl. D21—*01*
U.S. Cl. D34—15 AD

238,440
MINIATURE BASKETBALL GOAL
Louis J. Scarlotti, Drayton Plains, Mich. (105 Washington W., Apt. 3, Clarkston, Mich. 48016)
Filed July 18, 1973, Ser. No. 380,473
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 VV

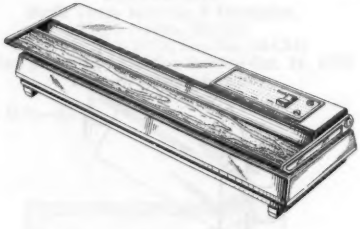
238,441
LAWN EDGER ATTACHMENT FOR SELF-PROPELLED LAWNMOWERS
Robert A. Julian, 1608 Brenda Drive, Bellevue, Nebr. 68005
Filed July 3, 1974, Ser. No. 486,152
Term of patent 14 years
Int. Cl. D8—*03;* D15—*03*
U.S. Cl. D40—1 A

238,442
PANEL SUPPORTED TRANSMISSION DUAL SHIFT CONTROL MODULE FOR MOBILE OR STATIONARY EQUIPMENT
Peter D. Adams, La Canada, and Warner R. Lauper, San Pedro, Calif.; said Lauper assignor to Quadrastat Controls Corporation
Filed Apr. 19, 1974, Ser. No. 462,229
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D55—1 G

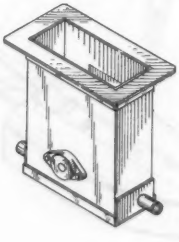


238,443
TRANSMISSION SHIFT CONTROL MODULE FOR MOBILE OR STATIONARY EQUIPMENT
Peter D. Adams, La Canada, and Warner R. Lauper, San Pedro, Calif.; said Lauper assignor to Quadrastat Controls Corporation
Filed Apr. 19, 1974, Ser. No. 462,230
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D55—1 G

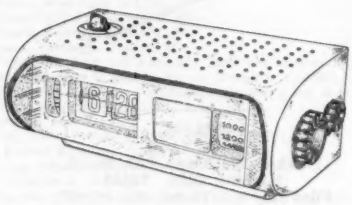
238,444
HEAT SEALING DEVICE
Bernard B. Schipper, Los Angeles, Calif., assignor to Pakline Corporation, North Hollywood, Calif.
Filed June 29, 1973, Ser. No. 375,039
Term of patent 14 years
Int. Cl. D8—*05;* D15—*99*
U.S. Cl. D55—1 F



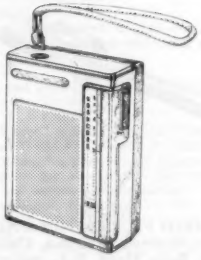
238,445
POULTRY FEED CHAIN LOADER
Gerald L. Kitson, 9709 Belding Road, Rockford, Mich. 49341
Original design application June 26, 1972, Ser. No. 266,488, now Patent No. 231,370. Divided and this application Apr. 16, 1974, Ser. No. 461,382
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D55—1 C



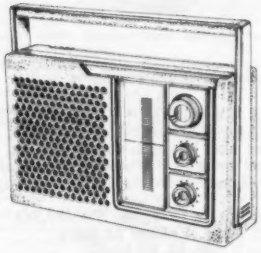
238,446
CLOCK RADIO
Shuhei Taguchi, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Oct. 30, 1973, Ser. No. 411,070
Claims priority, application Japan May 7, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



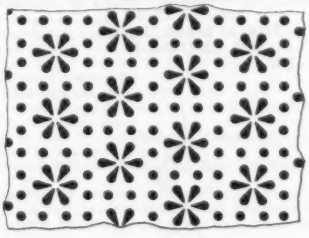
238,447
RADIO RECEIVER
Hiroshi Hirasa, Osaka, Kunio Hoshino, Kadoma, and Benito Mishiro, Sakai, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jan. 9, 1974, Ser. No. 431,970
Claims priority, application Japan Aug. 14, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



238,448
RADIO RECEIVER
Katsuhiko Makino, Hirakata, and Masanori Hamada, Moriguchi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed May 9, 1974, Ser. No. 468,512
Claims priority, application Japan Nov. 12, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



238,449
PAPER TOWELING
Ikki Matsumoto, Loveland, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed July 10, 1974, Ser. No. 487,360
Term of patent 14 years
Int. Cl. D5—*03*
U.S. Cl. D59—2 A



238,450
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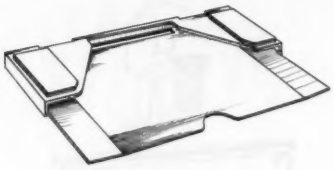
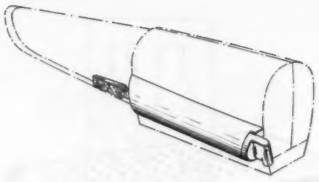
Donald A. Robertson, Fairport, and Howard D. Ring, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Apr. 30, 1974, Ser. No. 465,459
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 Q



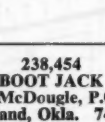
238,451
CABINET FOR AN INPUT-OUTPUT DEVICE FOR A DATA HANDLING SYSTEM
John R. Bittner and Kenneth C. McCartney, Waynesboro, Va., and Gregory F. Fossella, Marshfield, Mass., assignors to General Electric Company, Waynesboro, Va.
Filed Apr. 8, 1974, Ser. No. 458,563
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D64—11 C

238,452
CHAIN CANDLE
Siegfried Steinhart, 14 Obere Ganshalde, 8908 Krumbach, Germany
Original design application Aug. 22, 1972, Ser. No. 282,659, now Patent No. 233,175, dated Oct. 8, 1974. Divided and this application July 26, 1974, Ser. No. 492,352
Claims priority, application Germany Feb. 25, 1972; Mar. 10, 1972
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D73—1 B

238,453
HAIR GROOMER ATTACHMENT
Joseph Kata, New Haven, and Martin J. Wolff, West Haven, Conn., assignors to Sperry Remington, Sperry Rand Corporation, Bridgeport, Conn.
Filed Oct. 1, 1973, Ser. No. 402,454
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F

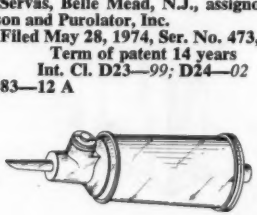


238,454
BOOT JACK
Frank O. McDougle, P.O. Box F, Fairland, Okla. 74343
Filed May 8, 1974, Ser. No. 467,871
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D86—10 D



238,455
STEAM CURLING IRON
Martin J. Wolff, West Haven, Conn., assignor to Sperry Remington, Sperry Rand Corporation, Bridgeport, Conn.
Filed June 17, 1974, Ser. No. 480,049
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 E

238,456
BLOOD FILTRATION UNIT
Herman Charles Mouwen, Ventura, Calif., and Francis Martin Servas, Belle Mead, N.J., assignors to Johnson & Johnson and Purolator, Inc.
Filed May 28, 1974, Ser. No. 473,478
Term of patent 14 years
Int. Cl. D23—*99*; D24—*02*
U.S. Cl. D83—12 A



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Ashland Oil, Inc.: *See—*
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94.5P	B 394,350	E	Jan. 13, 1976
Class 335			
210	B 541,517	E	Jan. 13, 1976
Class 340			
174TF	B 476,681	E	Jan. 13, 1976
Class 343			
7A	B 248,240	E	Jan. 13, 1976
Class 358			
41	B 502,289	E	Jan. 13, 1976
Class 403			
318	B 540,632	M	Jan. 13, 1976
Class 404			
71	B 452,672	M	Jan. 13, 1976
Class 408			
124	B 501,993	M	Jan. 13, 1976
Class 415			
213R	B 512,547	M	Jan. 13, 1976
Class 423			
315	B 471,221	C	Jan. 13, 1976
390	B 549,198	C	Jan. 13, 1976
Class 424			
122	B 524,179	C	Jan. 13, 1976
274	B 496,431	C	Jan. 13, 1976
Class 426			
276	B 535,944	C	Jan. 13, 1976
Class 427			
70	B 381,709	C	Jan. 13, 1976
207	B 501,415	C	Jan. 13, 1976
343	B 160,099	C	Jan. 13, 1976
Class 428			
73	B 481,737	C	Jan. 13, 1976
434	B 457,886	C	Jan. 13, 1976

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF JANUARY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. P. Green Refractories Co.: *See—*
Truman, George H., 3,931,959.

A/S Ardal og Sunndal Verk: *See—*
Blindheim, Rolf, 3,932,100.

AB Carbox: *See—*
Trolle, Sten, 3,931,728.

Abbott, Frank R., to United States of America, Navy. Towable VLF sonar projector. 3,932,835, Cl. 340-7.00R.

Abbott Laboratories: *See—*
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Crovetti, Aldo Joseph; Kenney, Donald Sykes; Lynch, Don Murl; and Stein, Robert George, 3,932,453.
Freiberg, Leslie Alan, 3,932,383.
Stein, Robert George; and Crovetti, Aldo Joseph, 3,932,168.
Winn, Martin, 3,932,432.

Abe, Hiroshi: *See—*
Moriguchi, Sanseki; Abe, Hiroshi; Saito, Kiyoshi; and Miyazawa, Makoto, 3,932,585.

Abe, Zenuemon; Tanaka, Kunio; Hotta, Masao; and Imai, Masaaki, to Kichizo Niwa. Method of obtaining internal information of a measuring target from the out-side by the application of a nuclear magnetic resonance phenomenon. 3,932,805, Cl. 324-.5OA.

Ackley, Edward M., to R. W. Hartnett Company. Apparatus for transporting and orienting capsules. 3,931,884, Cl. 198-287.000.

Adachi, Takao: *See—*
Miyano, Katao; Tomizuka, Shunichi; Adachi, Takao; Takenouchi, Tomoo; Kondo, Satoshi; Hirama, Akira; and Endo, Yasuo, 3,932,200.

Adams, Charles De Witt, to Du Pont de Nemours, E. I., and Company. Trans-octahydropyridoindolobenzazepines as central nervous system depressants. 3,932,650, Cl. 424-267.000.

Adams, Stewart Sanders; Armitage, Bernard John; and Nicholson, John Stuart, to Boots Company Limited, The. 2-(Substituted biphenylyl) propionic acids. 3,932,499, Cl. 260-515.00A.

Adamson, Thomas E., to VF Corporation. Warp knitted elastic fabric. 3,931,721, Cl. 66-195.000.

Aday, Roy W., Jr.; and Barber, Duane G., to Beckman Instruments, Inc. Gamma counter shutter assembly. 3,932,752, Cl. 250-328.000.

Addressograph Multigraph Corporation: *See—*
Kolibas, James A., 3,931,793.

Adie, Richard A.: *See—*
Salmon, John Kennedy; and Adie, Richard A., 3,932,442.

Adler, Robert, to Zenith Radio Corporation. Self-compensating focus system for a reflective video disc. 3,932,701, Cl. 178-6.60R.

Adolphi, Heinrich; Hoffmann, Hans-Dieter; Koenig, Karl-Heinz; and Rohr, Wolfgang, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Insecticidal compositions containing an organophosphorus compound and a thiolcarbamate. 3,932,632, Cl. 424-213.000.

Aero-Dyne Manufacturing, Inc.: *See—*
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Aerojet-General Corporation: *See—*
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AFE Industries, Inc.: *See—*
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Agency of Industrial Science and Technology: *See—*
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Alberto, Vicente S.; and Clash, David G., to Union Carbide Corporation. Primary dry cell with gas-venting passageway through the cathode mix. 3,932,196, Cl. 136-107.000.

Albrecht, Raymond E.: *See—*
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Albrecht, William L.; and Fleming, Robert W., to Richardson-Merrell Inc. Bis-basic ethers of carbazole. 3,932,424, Cl. 260-293.610.

Albrecht, William L.; and Fleming, Robert W., to Richardson-Merrell Inc. Bis-basic esters and amides of carbazole. 3,932,456, Cl. 260-315.000.

Albright, Charles Jere; Fitch, Clifford E., Sr.; and Fitch, Clifford E., Jr., to Chemetron Corporation. Closure lid for closing the opening of a food cooking receptacle. 3,931,910, Cl. 220-329.000.

Alburger, James R. Method and means of accelerating removal of background entrapments in the inspection penetrant process. 3,931,733, Cl. 73-104.000.

Alburn, Harvey E.; and Dvonch, William, to American Home Products Corporation. Cephalosporin isocyanates. 3,932,391, Cl. 260-243.00C.

Alcan Research and Development Limited: *See—*
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Aldrich, Charles S.: *See—*
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Alexander, James C., to Quaker Oats Company, The. Dump mechanism for toy truck. 3,931,693, Cl. 46-214.000.

All-Steel, Inc.: *See—*
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Allis-Chalmers Corporation: *See—*
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Frank, Kjell; and Thorborg, Kjeld, 3,932,799.
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Larsson, Hans Gunnar; and Bergman, Carl, 3,932,178.
Lindholm, Gosta; and Astrom, Erling, 3,932,205.
Madsen, Kristian Dahl, 3,932,779.

Alms, Erhard E.; and Mitchell, James E., to AFE Industries, Inc. Baffles for grain dryer. 3,932,119, Cl. 432-101.000.

Alpert, Martin Aaron. Air car. 3,931,942, Cl. 244-12.00R.

Althouse Tertre en abrege "Atsa" societe anonyme: *See—*
Brulard, Andre T., 3,932,379.

Altiparmakian, Rodolf; and Bohler, Hans, to Sandoz Ltd., (Sandoz AG). Acridone compounds. 3,932,414, Cl. 260-279.00R.

ALZA Corporation: *See—*
Ramwell, Peter W.; Shio, Hideo; and Shaw, Jane E., 3,932,656.

Amax Inc.: *See—*
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AMAX Resource Recovery Systems, Inc.: *See—*
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Ambrosio, Biagio F., to Electronic Memories & Magnetics Corporation. Point-of-action billing transactor. 3,932,730, Cl. 235-61.90R.

Amchem Products, Inc.: *See—*
Schneider, George, 3,932,198.
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Amelio, Gilbert F., to Fairchild Camera and Instrument Corporation. Self aligned CCD element including two levels of electrodes and method of manufacture therefor. 3,931,674, Cl. 29-578.000.

American Cyanamid Company: *See—*
- Arzoumanidis, Gregory Gerasimos; and Rauch, Francis Clyde, 3,932,474.
- Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 3,932,479.
- Brand, William Wayne; and Reger, David William, 3,932,507.
- Cross, Barrington; and Feeny, Richard William, 3,932,167.
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- Schaub, Robert Eugene; Floyd, Middleton Brawner, Jr.; and Weiss, Martin Joseph, 3,932,463.
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Ammenheuser, Herbert H., to Stromberg-Carlson Corporation. Printed circuit card receptacle. 3,932,016, Cl. 339-65.000.

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- Dechelette, Helen, 3,932,017.
- Dittmann, Larry Eugene, 3,931,671.
- Grubb, Daniel Baker, 3,931,726.
- Parsons, Stuart L.; and Wasserlein, Henry George, Jr., 3,932,018.
- Yeager, Marvin Leo; and Henschen, Homer Ernst, 3,932,013.

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- Albaugh, LeMar L., 3,931,877.

Anchor Hocking Corporation: *See—*
- Thrush, James Lloyd, 3,932,113.

Anderson, Alan S., to Williamson Corporation. Null balance radiometric apparatus. 3,932,744, Cl. 250-203.000.

Anderson, Grant L., to Clear Air, Inc. Closed water system in municipal incineration plants. 3,932,280, Cl. 210-119.000.

Anderson, Paul L., to Sandoz, Inc. Phenoxyphenyl-butadienols. 3,932,530, Cl. 260-613.00R.

Anderson, Ray H.; and Saari, Albert L., to General Mills, Inc. Food composition. 3,932,608, Cl. 424-54.000.

Andersson, Sven Ingemar. Method of making a multilayered packaging tray by deep-drawing. 3,932,575, Cl. 264-154.000.

Ando, Kozo: *See—*
- Otake, Nobuyuki; Sato, Yukinori; and Ando, Kozo, 3,932,044.

Ando, Momofuku, to Nissin Shokuhin Kaisha, Ltd. Apparatus for manufacturing waved noodles. 3,932,089, Cl. 425-294.000.

Anthony, Paul B., Jr., to United States Steel Corporation. Method of making briquettes with machine having an inert gas seal. 3,932,169, Cl. 75-3.000.

Antonevich, John N., to Blackstone Corporation. Ultrasonic flame soldering tool. 3,931,921, Cl. 228-1.000.

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- Staab, Joachim; Apel, Willy; Drager, Achim; Haberditz, Wilhelm-Rudiger; and Fabinksi, Walter, 3,932,041.

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Arai, Tomiji, to Nissan Motor Company Limited. Temporary latch releasing mechanism for two door vehicle front seat. 3,931,995, Cl. 297-341.000.

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Arctic Enterprises, Inc.: *See—*
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Argurio, Frederico; Borsatti, Mario; and Busby, William James, to Exxon Research and Engineering Company. Self-sealing films. 3,932,563, Cl. 260-897.00B.

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- Lewis, Roger N.; and Friedman, Ronald L., 3,932,372.

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Arimura, Katsuo; and Ao, Hideki, to Yoshitomi Pharmaceutical Industries. Imidazolido(1,5-c)thiazolidine-3-spiro-4-piperidines. 3,932,423, Cl. 260-293.570.

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Arnold, James F., to HydroTech International, Inc. Apparatus and method for connecting two axially spaced apart pipes. 3,931,670, Cl. 29-157.00R.

Arpe, Hans-Jurgen, to Hoechst Aktiengesellschaft. Methylation of cyclohexanone with simultaneous dehydrogenation. 3,932,518, Cl. 260-586.00R.

Arter, Nelson K.; Eichhorn, Thomas F.; and Kalthoff, Clement H., to International Business Machines Corporation. Magnetic record member for use with rotating head magnetic recording apparatus. 3,932,894, Cl. 360-134.000.

Arzoumanidis, Gregory Gerasimos; and Rauch, Francis Clyde, to American Cyanamid Company. Preparation of antraquinone. 3,932,474, Cl. 260-369.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
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- Asakusa, Tokuzo; Honma, Taketoshi; Hirashita, Isao; Yasui, Koichi; Nishi, Yoshio; and Murayama, Koichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for purifying hydrogen sulfide-containing gas. 3,932,584, Cl. 423-234.000.

Ashfield, Herbert Edward; and Hull, Charles Hartley, to David Brown Tractors Limited. Internal combustion engines. 3,931,812, Cl. 123-73.00S.

Ashton, Stanley; Sharma, Vijay Ratna; and Taylor, John Anthony, to Imperial Chemical Industries Limited. Phosphorus acid amides. 3,932,403, Cl. 260-248.00R.

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- Branch, Robert L., 3,932,811.

Ayer, Thad E., to International Business Machines Corporation. Document handling apparatus. 3,931,880, Cl. 198-29.000.

Aziende Colori Nazionali Affini Acna S.p.A.: *See—*
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Baker, Alfred Dickens, to Lucas Electrical Company Limited. Vehicle lamp assembly. 3,932,837, Cl. 240-41.600.

Bakermans, Johannes Cornelis Wilhelmus, to AMP Incorporated. Bundle strapping tool. 3,931,838, Cl. 140-123.600.

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Balentine, George H., Jr. Heat splicing apparatus. 3,932,260, Cl. 156-583.000.

Ball, Dean M.; Camp, Ronnie W.; Hendrix, Warren P.; and Orr, Clyde, Jr., to Micromeritics Instrument Corporation. Liquid chromatography apparatus and method. 3,932,067, Cl. 417-339.000.

Balogh, John J., Jr.: *See—*
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Bamji, Pervez Jal, to Alcan Research and Development Limited. Apparatus for circulating molten metal. 3,931,960, Cl. 266-34.00A.

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Barber, Duane G.: *See—*
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Barberia, Oscar; and Testi, Angel Rogelio. Method of making a double-walled tubular container. 3,931,776, Cl. 113-120.0XY.

Barie, Walter P., Jr., to Gulf Research & Development Company. Mixed epoxy resin-mixed anhydride adhesive compositions. 3,932,343, Cl. 260-37.0EP.

Barnes, Allen L., to Atlantic Richfield Company. Method of heating a subterranean formation. 3,931,856, Cl. 166-245.000.

Barnette, William E.: *See—*
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Barth, Jordan B.; and Costello, Christopher H., to Colgate-Palmolive Company. Dentifrice. 3,932,606, Cl. 424-52.000.

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Bartley, Charles E.; and Settlemire, Lawrence R. Solid propellant with butyl rubber binder. 3,932,242, Cl. 149-19.900.

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Batorewicz, Wadim, to Uniroyal Inc. Polymeric bromine-containing phosphoramidate polyols. 3,932,565, Cl. 260-928.000.

Batter, John F., Jr., to Polaroid Corporation. Photographic projecting strip film in a cassette. 3,932,187, Cl. 96-78.000.

Battisti, Ruggero: *See—*
Merlo, Fabrizio; Battisti, Ruggero; and Domenis, Danilo, 3,932,377.

Baude, Frederic J., to Du Pont de Nemours, E. I., and Company. 2-(Alkoxycarbonylamino)-1-benzimidazolecarboxylic acid esters with hydroxyaliphatic acids and derivatives thereof. 3,932,448, Cl. 260-309.200.

Bauer, Andreas: *See—*
Oehm, Klaus; Seiffert, Ulrich; Struwe, Burckhard; Fiala, Ernst; Bauer, Andreas; Weissner, Ruediger; and Schwanz, Wilfried, 3,931,988.

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Bayer Aktiengesellschaft: *See—*
Burkhardt, Claus; Raichle, Karl; and Behrenz, Wolfgang, 3,932,612.
Buttner, Gerhard; Sasse, Klaus; Hammann, Ingeborg; and Kaspers, Helmut, 3,932,406.
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Beall, Glenn Lee; Dodge, John Dennis; Koschalk, Robert Francis; and Soika, Emil Henry, to Abbott Laboratories. Apparatus for determining immunoassays of antigens and their antibodies. 3,932,141, Cl. 23-259.000.

Beamar, Samuel W. Means for forming a reinforced concrete module. 3,932,082, Cl. 425-125.000.

Beaulieu, Robert J., to Millmaster Onyx Corporation. Dye carriers for polyamide fibers. 3,932,128, Cl. 8-173.000.

Beck, Frederick R., to McGill Manufacturing Company, Inc. Packaging structure for items provided on wires or cords. 3,931,887, Cl. 206-419.000.

Beckman Instruments, Inc.: *See—*
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Beecham Group Limited: *See—*
Green, Joseph; and Morgan, Brian, 3,932,659.

Beeskow, Bruno; Worner, Gunter; and Schrape, Peter, to Daimler-Benz Aktiengesellschaft. Clutch disk for motor vehicle main clutches. 3,931,876, Cl. 192-106.200.

Beets, Roland H. C.: *See—*
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Beloit Corporation: *See—*
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Ben-Dov, Oded, to RCA Corporation. Short end-fire circularly polarized antenna. 3,932,876, Cl. 343-895.000.

Bendix Corporation, The: *See—*
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Rachel, Todd Leonard, 3,931,808.

Benham, George K.: *See—*
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Bennett, David J., to Environmental Technology Corporation. Treatment of trees for prevention and cure of wilt diseases. 3,932,666, Cl. 424-341.000.

Bennett, Richard H.; and Brockington, James W., to Texaco Inc. Inhibition of aluminum corrosion by sulfuric acid solutions. 3,932,130, Cl. 21-2.70R.

Bensen, Richard E. Latching means. 3,931,926, Cl. 229-45.00R.

Bensky, Norman D.: *See—*
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Bentrop, Roland Schulze: *See—*
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Berdyansky, Mark Grigorievich; Khodak, Zarislav Zakharovich; Veevnik, Vladimir Fomich; Dovgan, Vladimir Semenovich; Bashkatov, Vladimir Porfirievich; Kasyan, Vladimir Khrisanfovich; Bezkrovny, Konstantin Fedorovich; and Tsekhnovich, Lev Izrailevich. Plug-retaining device for use in piercing and plugging mills. 3,931,724, Cl. 72-97.000.

Berg, Carl John; and Deviny, Edward John, to Minnesota Mining and Manufacturing Company. Mixed acrylic acid/methacrylic acid esters of tris (hydroxyalkyl) isocyanurates. 3,932,401, Cl. 260-248.0NS.

Berg, Rudolph G.; and Tate, Bryce E., to Pfizer Inc. Citraconic anhydride process. 3,932,469, Cl. 260-346.80R.

Berger, Josef, to Hewlett-Packard Company. Charge transfer device. 3,932,882, Cl. 357-24.000.

Bergeron, Charles R., to Ethyl Corporation. Preparation of fatty acid amides. 3,932,476, Cl. 260-404.000.

Bergman, Carl: *See—*
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Beriot, Alain, to Thomson-CSF. Specialized digital computer with divided memory and arithmetic units. 3,932,845, Cl. 340-172.500.

Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, to American Cyanamid Company. Lithium 3-triphenylmethoxy-1-trans-alkenyl-dialkyl alanates. 3,932,479, Cl. 260-448.00A.

Berthoux, Jean; and Schwachhofer, Ghislain, to Rhone-Progil. Process of manufacturing carbon bisulfide. 3,932,595, Cl. 423-443.000.

Beta Corporation of St. Louis: *See—*
Zarow, Albert I.; and Volk, Joseph A., Jr., 3,932,736.

Bethlehem Steel Corporation: *See—*
Rohatgi, Pradeep Kumar, 3,932,596.

Bettis, Edward S.; and Watts, Harry L., to United States of America, Energy Research and Development Administration. High current capacity electrical connector. 3,932,014, Cl. 339-22.00B.

Betz Laboratories, Inc.: *See—*
Libutti, Bruce L.; and Neddenriep, Richard J., 3,932,588.

Beverung, Warren Neil, Jr.; and Partyka, Anthony, to Bristol-Myers Company. Optionally substituted 1,2,3,5-tetrahydroimidezo(2,1-b)-quinazolin-2-ones and 6(H)-1,2,3,4-tetrahydropyimido(2,1-b)quinazolin-2-ones. 3,932,407, Cl. 260-256.40F.

Bewersdorf, Elmer D., to McCain Manufacturing Corporation. Folding machines. 3,931,963, Cl. 270-61.000.

Bezkrovny, Konstantin Fedorovich: *See—*
Berdyansky, Mark Grigorievich; Khodak, Zarislav Zakharovich; Veevnik, Vladimir Fomich; Dovgan, Vladimir Semenovich; Bashkatov, Vladimir Porfirievich; Kasyan, Vladimir Khrisanfovich; Bezkrovny, Konstantin Fedorovich; and Tsekhnovich, Lev Izrailevich, 3,931,724.

Bharucha, Kekhusroo R.; Ajdukovic, Djordje; Pavilanis, Vytautas; and Mackay, Angus Campbell, to Canada Packers Limited. Antiviral 1,2,3,4-tetrahydro-1,-alkano naphthalenamine derivatives. 3,932,512, Cl. 260-570.900.

Bianco, Pablo: *See—*
Corte, Francisco Barcelloni; and Bianco, Pablo, 3,931,809.

Bickel, Frederic W.; and Long, Richard L., to McDonnell Douglas Corporation. Continuous belt system holding multiple layers. 3,931,881, Cl. 198-165.000.

Bickel, Hans: *See—*
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Bien, Hans-Samuel: *See—*
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Klauke, Erich; Schmitz, Reinhold; and Bien, Hans-Samuel, 3,932,473.

Bien, Jack M. Power operated back rest. 3,931,653, Cl. 5-327.00B.

Bierling, Robert: *See—*
Kunzel, Hans-Egon; Wolf, Gerhard Dieter; Bierling, Robert; Petersen, Siegfried; Nischk, Gunther; and Steinhoff, Dieter, 3,932,409.

Bigelow, John Howard; and Richman, Jack E., to Du Pont de Nemours, E. I., and Company. 1,4,7,10-Tetraazatetracyclo[5.5.1.0^{4,10}.0^{10,13}]-tridecane and its conjugate acids. 3,932,451, Cl. 260-309.600.

Bilal, Abdel-Lativ; Metscher, Klaus; Muhlig, Bernhard; Reichmuth, Christoph; Schwarz, Bernd; and Zimen, Karl-Erik, to Hahn-Meitner-Institut fur Kernforschung Berlin GmbH. Process for separately recovering uranium, transuranium elements, and fission products of uranium from atomic reactor fuel. 3,932,225, Cl. 204-1.500.

Billings, Charles A.; O'Neill, Gerald J.; Simons, Charles W.; and Holdsworth, Robert S., to W. R. Grace & Co. Halocyclopropyl halomethyl ethers. 3,932,529, Cl. 260-611.00R.

Bilofsky, Ruth C.; and Cramer, Richard D., to Polaroid Corporation. Carbazole phthaleins. 3,932,455, Cl. 260-315.000.

Bindra, Jasjit S.: *See—*
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Binks Manufacturing Company: *See—*
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Bio-Logics Products, Inc.: *See—*
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Bio-Medical Sciences, Inc.: *See—*
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Bio-Medicus, Inc.: *See—*
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Bison, Gunter; Heinzelmann, Walter; Linkat, Norbert; and Wolfes, Wolfgang, to Dynamit Nobel Aktiengesellschaft. Process for the production of pure tetrazole-1-acetic acid. 3,932,441, Cl. 260-308.00D.

Bison-Werke Bahre & Greten GmbH & Co. KG: *See—*
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Black, Sivalls & Bryson, Inc.: *See—*
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Blackstone Corporation: *See—*
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Blake, Donald Arthur, to Raymond Lee Organization, Inc., The, a part interest. Spit. 3,931,758, Cl. 99-419.000.

Blankenship, Michael G., to Corning Glass Works. Method of making glass optical waveguide. 3,932,162, Cl. 65-3.000.

Blaskiewicz, Arthur A.: *See—*
Cantor, Stephen E.; and Blaskiewicz, Arthur A., 3,932,559.

Bliley Electric Company: *See—*
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Blindheim, Rolf, to A/S Ardal og Sunndal Verk. Vibratory device. 3,932,100, Cl. 425-432.000.

Bliss & Laughlin Industries, Inc.: *See—*
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Block, David A.: *See—*
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Blomster, Jens: *See—*
Olsen, Bengt; Blomster, Jens; Buss, Nils; Stenkvist, Bjorn; and Preuss, Lucien, 3,932,733.

Bloom, Abraham. Rotary internal engines. 3,931,807, Cl. 123-8.050.

Blue, Maurice R.; and Younker, Glen, to Slip-Not Corporation. Dispensing-type box. 3,931,916, Cl. 222-465.000.

Bluhm, Harold Frederick, to Atlas Powder Company. Explosive priming device. 3,931,763, Cl. 102-28.00R.

Blum, Hans. Method of comminuting tree stumps. 3,931,841, Cl. 144-309.00R.

Bodony, Andrew B., to Coherent Communications System Corporation. Coherent digital frequency shift keying system. 3,932,704, Cl. 178-66.00A.

Boehringer Ingelheim GmbH: *See—*
Losel, Walter; Merz, Herbert; Hoefke, Wolfgang; and Traunecker, Werner, 3,932,626.
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Boehringer Mannheim G.m.b.H.: *See—*
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Boettner, Jon E., to Barber-Colman Company. Injection molding control. 3,932,083, Cl. 425-145.000.

Bohler, Hans: *See—*
Altiparmakian, Rodolf; and Bohler, Hans, 3,932,414.

Bohner, Beat; Dawes, Dag; and Meyer, Willy, to Ciba-Geigy Corporation. Triazolyl phosphorus esters as pesticides. 3,932,630, Cl. 424-200.000.

Bohner, Beat: *See—*
Dawes, Dag; and Bohner, Beat, 3,932,629.

Boliden Aktiebolag: *See—*
Melkersson, Karl-Axel, 3,932,149.

Bolsey, Emil J. Image motion and change transducers and systems controlled thereby. 3,932,703, Cl. 178-6.800.

Bolton, Theodore S.; and Hammons, Burton F., to Carrier Corporation. Means for mounting a rotatable lever in a thin wall. 3,932,157, Cl. 62-408.000.

Bombarider Limited: *See—*
Cote, Yvon, 3,931,862.

Bond, Joseph Kim: *See—*
Korff, Wolfram G.; Emery, Vernon V.; Bond, Joseph Kim; and Hash, Robert S., 3,932,094.

Bonfield, John H., to Allied Chemical Corporation. Process for the synthesis of ammonium nitrite. 3,932,593, Cl. 423-385.000.

Bono, Pierre: *See—*
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Boots Company Limited, The: *See—*
Adams, Stewart Sanders; Armitage, Bernard John; and Nicholson, John Stuart, 3,932,499.

Borror, Alan L.; Hill, Ruth Linda; and Zuckerman, Bernard, to Polaroid Corporation. Spectrally sensitized photographic silver halide emulsion. 3,932,186, Cl. 96-77.000.

Bors, Constantin: *See—*
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Borsatti, Mario: *See—*
Argurio, Frederico; Borsatti, Mario; and Busby, William James, 3,932,563.

Bortel, Donald C.: *See—*
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Bossert, Friedrich: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,932,645.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,932,646.

Boudreaux, Gordon J.: *See—*
Daigle, Donald J.; Pepperman, Armand B., Jr.; and Boudreaux, Gordon J., 3,932,390.

Bowen, Dennis Dawes, to Bowpark Developments Limited. Ignition circuits for internal combustion engines. 3,931,804, Cl. 123-148.00E.

Bowman, Earl K.; and Teele, John C., to United States of America, Agriculture. Automatic produce-bagging machine that uses factory-roll polyethylene net tubing. 3,931,701, Cl. 53-59.00R.

Bowpark Developments Limited: *See*—
Bowen, Dennis Dawes, 3,931,804.

Bradley, Edmund G., to Her Majesty the Queen in right of Ontario, as represented by the Minister of Natural Resources. Seedling planter apparatus. 3,931,774, Cl. 111-3.000.

Bradshaw, Janice: *See*—
Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, 3,932,385.

Bradu, Georges, to Societe des Verreries Industrielles Reunies du Loing. Bulbs for cathode tubes, particularly for television tubes. 3,931,906, Cl. 425-505.000.

Bragdon, Robert Wright: *See*—
Thunberg, Jon Carl; Bragdon, Robert Wright; and Moore, William Philip, 3,932,501.

Branch, Robert L., to Avtron Manufacturing, Inc. Method and apparatus for testing windings or the like. 3,932,811, Cl. 324-158.0MG.

Brand, William Wayne; and Reger, David William, to American Cyanamid Company. Process for the chlorination of aromatic isocyanide dichlorides. 3,932,507, Cl. 260-566.00D.

Brandman, Harold A.; Manowitz, Milton; and Newman, William E., to Givaudan Corporation. Preservation of aqueous systems with dialkyl bromonitromalonates. 3,932,654, Cl. 424-313.000.

Brannon, Donald R.; and Horton, Donald R., to Eli Lilly and Company. Metabolite A-27106 and processes for its preparation and use. 3,932,619, Cl. 424-120.000.

Braun, Franz; Thiel, Max; Stach, Kurt; Roesch, Egon; and Roesch, Androniki, to Boehringer Mannheim G.m.b.H. 3,4-Dihydro-2H-naphthalene-1-one-5-oxypropyl-piperazine compounds. 3,932,411, Cl. 260-268.0BC.

Braun, John D.; Nielsen, Arnold; Pickett, M. Frank; Henry, Ronald; and Norris, William P., to United States of America, Navy. Burning rate modifying binder for propellant and method. 3,932,240, Cl. 149-19.200.

Braun, Siegfried; and Herbst, Fritz, to Zahnradfabrik Friedrichshafen AG. Self-actuating friction-clutch assembly. 3,931,874, Cl. 192-54.000.

Brefka, Paul E., to Millipore Corporation. Electrophoresis slide mounting means. 3,932,263, Cl. 204-299.000.

Brettman, Donna M., administratrix: *See*—
Crowell, Kenneth E.; and Brettman, William M., deceased, 3,932,721.

Brettman, William M., deceased: *See*—
Crowell, Kenneth E.; and Brettman, William M., deceased, 3,932,721.

Breuer, Hermann; and Treuner, Uwe, to E. R. Squibb & Sons, Inc. Cyanomethylthioacetylcephalosporins. 3,932,396, Cl. 260-243.00C.

Breuer, Hermann; and Treuner, Uwe, to E. R. Squibb & Sons, Inc. Cyanomethylthioacetylcephalosporins. 3,932,397, Cl. 260-243.00C.

Bridgestone Tire Company Limited: *See*—
Harada, Jumei; Tsukamoto, Kenji; Migita, Tetsuhiko; and Matsunaga, Tsutomu, 3,932,088.

Brinkman, Heinz; Gersbeck, Rolf; and Greten, Berndt, to Hermann Berstorff Maschinenbau GmbH; and Bison-Werke Bahre & Greten GmbH & Co. KG. Apparatus for the continuous production of chipboard, fibreboard and like panels. 3,932,258, Cl. 156-498.000.

Bristol-Myers Company: *See*—
Beverung, Warren Neil, Jr.; and Partyka, Anthony, 3,932,407.
Johnson, David A.; Brundidge, Steven P.; Vulcano, Albert L.; Sapino, Chester, Jr.; Mahan, James; and Grossman, Joseph H., 3,932,392.

British Aluminium Company Limited, The: *See*—
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British Secretary of State for Defense, The: *See*—
Damon, Lionel; and Scoffield, Brian Philip, 3,932,820.
Rowland, Michael Charles; and Wight, David Robert, 3,932,883.

Brixey, Charles W.; Hartsell, Glenn A.; and Vandierendonck, Jerry L., to Texas Instruments Incorporated. Electronic calculator having internal means for turning off display. 3,932,846, Cl. 340-172.500.

Broadbent, Douglas; Hemming, Harold George; and Hesp, Barrie, to Imperial Chemical Industries Limited. Antiviral complex. 3,932,394, Cl. 260-243.00R.

Brockington, James W.: *See*—
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Broken Hill Proprietary Company, Ltd., The: *See*—
Dalli, Alan George; Debenham, Michael; and Shackleford, Ralph Edward, 3,931,909.

Brotzmann, Karl: *See*—
Knuppel, Helmut; Brotzmann, Karl; Fassbinder, Hans-Georg; Savard, Guy; and Lee, Robert, 3,932,172.

Brown, Allen C.: *See*—
Eyrick, Theodore B.; and Brown, Allen C., 3,932,066.

Brown, Richard E.; and Lustgarten, David M., to Warner-Lambert Company. Substituted 2-amino chromones and process for the preparation thereof. 3,932,466, Cl. 260-345.200.

Brown, William A., to Cogar Corporation. Semiconductor diffusion process. 3,932,239, Cl. 148-186.000.

Brownlee, George Hunnam: *See*—
Osborn, Leroy Gordon; and Brownlee, George Hunnam, 3,932,033.

Brulard, Andre T., to Althouse Tertre en abrege "Atsa" societe anonyme. Water-soluble maroon and rubine sulphodiphenylazophenyl- or naphthylazoaniline dyes for polyamide fibers. 3,932,379, Cl. 260-191.000.

Brumlik, George C., to Ingrip Fasteners, Inc. Adjustable extrusion apparatus for producing thread-like products. 3,932,090, Cl. 425-381.000.

Brundidge, Steven P.: *See*—
Johnson, David A.; Brundidge, Steven P.; Vulcano, Albert L.; Sapino, Chester, Jr.; Mahan, James; and Grossman, Joseph H., 3,932,392.

Brundin, Bengt, to Siemens Aktiengesellschaft. X-ray diagnostic installation providing for the free and programmed setting of the X-ray exposure data. 3,932,759, Cl. 250-416.000.

Brunswick Corporation: *See*—
Croisant, Elmer E., 3,931,783.
Walker, Jerome F., 3,931,966.

Bucalo, Louis, to Investors in Ventures, Inc. Lumen reamer. 3,931,820, Cl. 128-304.000.

Bucalo, Louis. Culturing medium. 3,932,223, Cl. 195-139.000.

Bucek, Jiri B.; and Shultz, James R., to Fincor, Inc. Control for three phase A.C. motor. 3,932,771, Cl. 307-265.000.

Buchi, George H.; and Freidinger, Roger M., to Massachusetts Institute of Technology. Preparation of polyenes. 3,932,546, Cl. 260-666.00C.

Buchmann, Paul; Beringer, Monique; and Sporri, Heinz, to Tamag/Basel AG. Extruder nozzle for shaping a pulp to form smokable strands or fibers. 3,932,081, Cl. 425-72.000.

Buck, Robert. Electronic monitoring system with short-circuit protection. 3,932,774, Cl. 307-308.000.

Buck, Robert. Electronic monitoring system including contactless motion detector. 3,932,803, Cl. 323-19.000.

Buckman Laboratories, Inc.: *See*—
Fenyes, Joseph G. E.; and Flanagan, Kenneth J., 3,932,478.

Bugajski, Frank H.: *See*—
Robins, Norman A.; and Bugajski, Frank H., 3,932,683.

Buhrer, Carl F., to GTE Laboratories, Incorporated. Magnetic field drive coils for field accessed cylindrical domain memories. 3,932,827, Cl. 336-60.000.

Buhrer, Rolf. Self-aligning coupling. 3,931,720, Cl. 64-31.000.

Bull, George Carter, to Elliott Brothers (London) Limited. Vehicle head-up display systems. 3,932,861, Cl. 340-324.0AD.

Burdy, Norbert; Ravet, Christian; and Lacave, Jean, to Fives Lille Cail. Mold apparatus. 3,932,099, Cl. 425-432.000.

Burgkhardt, Bertram; and Piesch, Ernst, to Gesellschaft fur Kernforschung m.b.H. Method and apparatus for determining the dose value of neutrons. 3,932,758, Cl. 250-390.000.

Burke, Noel L., to Tee-Pak, Inc. Collagen casings from limed hide collagen. 3,932,677, Cl. 426-277.000.

Burkhardt, Claus; Raichle, Karl; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. Insecticidal compositions for sustained release of 0,0-dimethyl-0-(2,2-dichlorovinyl) phosphate. 3,932,612, Cl. 424-78.000.

Burmah Engineering Company Limited: *See*—
Grimston, Roger Anthony, 3,931,978.

Burman, Per Aron, to Burroughs Corporation. Multiple bit wire wrap tool. 3,931,839, Cl. 140-124.000.

Burroughs Corporation: *See*—
Burman, Per Aron, 3,931,839.

Burroughs Wellcome Co.: *See*—
Barrett, Paul Anthony, 3,932,663.

Burrous, Merwyn L., to Chevron Research Company. Functional fluid containing a hydrolysis suppressor. 3,932,294, Cl. 252-78.000.

Burton, Charles G., to Chisholm-Ryder Company, Inc. Cane separator for harvesting machine. 3,931,823, Cl. 130-30.00R.

Busby, William James: *See*—
Argurio, Frederico; Borsatti, Mario; and Busby, William James, 3,932,563.

Buss, Nils: *See*—
Olsen, Bengt; Blomster, Jens; Buss, Nils; Stenkvist, Bjorn; and Preuss, Lucien, 3,932,733.

Butler, Denis Victor, to Plessey Handel und Investments A.G. Liquid ring pumps. 3,932,063, Cl. 417-68.000.

Buttner, Gerhard; Sasse, Klaus; Hammann, Ingeborg; and Kaspers, Helmut, to Bayer Aktiengesellschaft. 2-Trifluoromethylimino-1,3-dithiolo [4,5-b]-quinoxalines. 3,932,406, Cl. 260-250.00Q.

Buzzolini, Mario G.; and Manning, Robert E., to Shandoz, Inc. Sulfuric acid esters of bis-(4-hydroxyphenyl)-methane. 3,932,481, Cl. 260-457.000.

B.V. Machinefabriek en Ijzergieterij Holland-Bergen op Zoom: *See*—
Jacobs, Christianus, 3,931,955.

Byrns, John. Nebulizer bacteria filter. 3,932,153, Cl. 55-511.000.

Byth, Nancy J., to Dow Chemical Company, The. Corrosion inhibitor. 3,932,296, Cl. 252-148.000.

C.A.V. Limited: *See*—
Chalmers, Brian John; and Gibson, John Philip, 3,932,798.

Cables de Lyon Alsacienne: *See*—
Comte, Georges N., 3,932,254.

Cachera, Pierre Charles, to Electricite de France. Method and device for the passive protection of a nuclear reactor. 3,932,217, Cl. 176-83.000.

Cagnac, Therese Marie Leonie: *See*—
Treluit, Jean Marie; Liot, Jean Bernard Michel; Cagnac, Therese Marie Leonie; and Chambet-Falquet, Antoine Jean Louis, 3,932,843.

Cahn, Jean: *See—*
Coirre, Paul; Coirre, Bertrand; Denis, Jean-Claude; Rambaud, Jerome; and Cahn, Jean, 3,932,638.

Caillet, Eugene, to Goodyear Tire & Rubber Company, The. Expansion tank diaphragm assembly. 3,931,834, Cl. 138-30.000.

Cairns, John G.; McPherson, John L.; and Orefice, James D., to Mobay Chemical Corporation. Method of and apparatus for the pouring of fast foaming reactants. 3,931,933, Cl. 239-591.000.

Calderon, Nissim, to Goodyear Tire & Rubber Company, The. Polymeric materials derived from ring-opening polymerization of 1,5-cyclooctadiene. 3,932,373, Cl. 260-93.100.

Caldwell, Henry C.; and Loev, Bernard, to SmithKline Corporation. Pharmaceutical compositions and methods of inhibiting gastric acid secretion. 3,932,641, Cl. 424-248.000.

Caldwell, John R.; and Hawkins, James Maynard, to Eastman Kodak Company. Electrically conducting adhesive composition. 3,932,311, Cl. 252-514.000.

Calgon Corporation: *See—*
Hollingshad, William Robert, 3,932,303.

California Institute of Technology: *See—*
Stevens, Mario R.; and Vickers, John Michael, 3,932,262.

Callahan, James L.: *See—*
Grasselli, Robert K.; Suresh, Dev. D.; and Callahan, James L., 3,932,551.

Camelon, Melville J.; and Gibeau, Rodney C., to Ford Motor Company. Powder paints containing particulate metal II. 3,932,320, Cl. 260-17.00R.

Camelon, Melville J.; and Gibeau, Rodney C., to Ford Motor Company. Powder paints containing particulate metal I. 3,932,347, Cl. 260-42.140.

Camelon, Melville J.; and Gibeau, Rodney C., to Ford Motor Company. Powder paints having aluminum flakes encapsulated in thermosettable material containing tetraalkylammonium halides. 3,932,348, Cl. 260-42.140.

Camelon, Melville J.; and Gibeau, Rodney C., to Ford Motor Company. Thermosettable powder paints containing encapsulated aluminum flakes II. 3,932,349, Cl. 260-42.140.

Camlibel, Irfan; Dabby, Franklin Winston; Pinnow, Douglas Arthur; and Van Uitert, LeGrand Gerard, to Western Electric Company, Inc.; and Bell Telephone Laboratories, Incorporated. Method for forming low loss optical waveguide fibers. 3,932,160, Cl. 65-3.000.

Camp, Ronnie W.: *See—*
Ball, Dean M.; Camp, Ronnie W.; Hendrix, Warren P.; and Orr, Clyde, Jr., 3,932,067.

Campbell, Francis Joseph, to RCA Corporation. Electron gun with a multi-element electron lens. 3,932,786, Cl. 315-3.000.

Canada Packers Limited: *See—*
Bharucha, Kekhusroo R.; Ajdukovic, Djordje; Pavilanis, Vytautas; and Mackay, Angus Campbell, 3,932,512.

Candor, James T. Liquid removing method and apparatus. 3,931,682, Cl. 34-1.000.

Candy, James Charles, to Bell Telephone Laboratories, Incorporated. Circuit for converting a companded digital time-amplitude pulse code into a linear digital amplitude pulse code. 3,932,864, Cl. 340-347.0DD.

Canick, Leon N.; and Aldrich, Charles S. Tape perforator. 3,931,929, Cl. 234-110.000.

Cannon, Richard A. Apparatus for warning of the failure of a sump pump. 3,932,853, Cl. 340-244.00B.

Canon Kabushiki Kaisha: *See—*
Kakei, Mitsuo; Nishida, Keijiro; Kasahara, Tadayoshi; Shimabayashi, Masao; Hiraga, Ryozo; Nakano, Tomomasa; and Komatsubara, Ichiro, 3,931,789.
Takahashi, Toru, 3,932,034.

Cantor, Stephen E.; and Blaskiewicz, Arthur A., to Uniroyal Inc. Adhesion of olefin copolymer rubber to nylon textile. 3,932,559, Cl. 260-847.000.

Capewell, Terence John; Lloyd, Arthur Leslie; and Marshall, David, to Lucas Aerospace Limited. Thrust reversal system for jet aircraft engines. 3,931,944, Cl. 244-110.00B.

Capra, Uberto. Scrubbing apparatus for vehicle-washing station. 3,931,660, Cl. 15-53.0AB.

Cardenas, Carlos G.: *See—*
Von Genk, Richard A.; and Cardenas, Carlos G., 3,932,543.

Carl Schenck AG, Firma: *See—*
Hack, Heinrich, 3,932,053.
Mueller, Martin, 3,932,740.

Carnes, W. Robert, Jr.; and Balogh, John J., Jr., to Pitney-Bowes, Inc. Scan system. 3,932,272, Cl. 209-73.000.

Carpenter, Leslie E., Jr.: *See—*
Willard, Edwin J.; and Carpenter, Leslie E., Jr., 3,931,883.

Carrier Corporation: *See—*
Bolton, Theodore S.; and Hammons, Burton F., 3,932,157.

Carrus, Andre; Carrus, Pierre A.; and Carrus, Jacques H. Method of continuous printing of documents. 3,931,761, Cl. 101-66.000.

Carrus, Jacques H.: *See—*
Carrus, Andre; Carrus, Pierre A.; and Carrus, Jacques H., 3,931,761.

Carrus, Pierre A.: *See—*
Carrus, Andre; Carrus, Pierre A.; and Carrus, Jacques H., 3,931,761.

Carson, William H. Blowout preventing device for vehicle wheels. 3,931,998, Cl. 301-63.00R.

Carter, Donald F., to Den-Tal-Ez Mfg., Co. Dental patient simulator. 3,931,679, Cl. 32-71.000.

Carter, Lyle. Apparatus for collecting surface particle on body of water. 3,931,740, Cl. 73-425.40R.

Casey, T. Eisirt: *See—*
O'Sullivan, Denis J.; and Casey, T. Eisirt, 3,931,678.

Caterpillar Tractor Co.: *See—*
Goloff, Alexander, 3,931,977.

Cathiard, Gaston, to Pomagalski S.A. Chairlift terminal. 3,931,766, Cl. 104-117.000.

Ceccarelli, Jovanna. Combined measuring spoon and receptacle. 3,931,741, Cl. 73-427.000.

Cecchetti, Claudio, to Arco Falc srl. Plastic game board having a unitary frame. 3,931,970, Cl. 273-85.00D.

Celanese Corporation: *See—*
Loft, John T.; Plovan, Steven G.; and Vogt, Clifford M., 3,932,682.
Miano, Ralph R.; and Keith, Charles H., 3,931,824.
Reader, Arthur M., 3,932,566.

Centre National d'Etudes Spatiales: *See—*
Wulleman, Vianney Jean-Marie Corneille, 3,932,705.

Centro Sperimentale Metallurgico S.p.A.: *See—*
Di Stefano, Vittorio; Grimaldi, Rinaldo; and Marini, Paolo, 3,932,135.

Ceprini, Mario Q.; and Gottesman, Roy T., to Tenneco Chemicals, Inc. Chromium salt compositions and a process for their production. 3,932,285, Cl. 252-1.000.

Cerankowski, Leon D.; Mattucci, Neil; and Baron, Richard C., to Polaroid Corporation. Polyurethane elastomers prepared from diamine curing agents. 3,932,360, Cl. 260-77.5AM.

Cerro Corporation: *See—*
Eggers, Frank W., III; Wigger, Ralph O.; and Coan, Richard L., 3,932,118.

Chalmers, Brian John; and Gibson, John Philip, to C.A.V. Limited. Electrical inverter circuit. 3,932,798, Cl. 321-45.00C.

Chambers, Ralph M., Jr.: *See—*
Faani, Siamac; and Chambers, Ralph M., Jr., 3,932,042.

Chambet-Falquet, Antoine Jean Louis: *See—*
Trelut, Jean Marie; Liot, Jean Bernard Michel; Cagnac, Therese Marie Leonie; and Chambet-Falquet, Antoine Jean Louis, 3,932,843.

Champlin, Roger A., to Goodyear Tire & Rubber Company, The. Method for preparing pigmented polyesters wherein the pigment glycol slurry is preheated. 3,932,345, Cl. 260-40.00P.

Chance, Leon H.; and Pepperman, Armand B., Jr., to United States of America, Agriculture. Flameproofing of cotton cellulose with hexamethyl phosphorous triamide. 3,932,123, Cl. 8-116.00P.

Chandler, William R.: *See—*
Lyons, Dianne D.; and Chandler, William R., 3,931,967.

Chang, Edward H.; and Nichols, Oliver D., to Fremont Industries, Inc. Cleaning and polishing compound for barrel and vibratory finishing of ferrous and non-ferrous metals. 3,932,243, Cl. 156-20.000.

Chapura, Francis B., to Morton-Norwich Products, Inc. Method of preventing leakage from body orifices when utilizing suppositories as a source of medication. 3,932,613, Cl. 424-78.000.

Chatterjee, Pronoy Kumar, to Personal Products Company. Low hemicellulose, dry crosslinked cellulosic absorbent materials. 3,932,209, Cl. 162-157.00C.

Chattopadhayay, Asoke; and Muller, Wolfgang. Fuel quantity manifold for multi-cylinder internal combustion engines. 3,931,803, Cl. 123-139.0AW.

Chauvette, Robert R., to Eli Lilly and Company. 3-Methylenecephalosporins and process for production thereof. 3,932,393, Cl. 260-243.00C.

Cheatum, Leo George, to Deere & Company. Bale length control mechanism. 3,931,760, Cl. 100-4.000.

Chemetron Corporation: *See—*
Albright, Charles Jere; Fitch, Clifford E., Sr.; and Fitch, Clifford E., Jr., 3,931,910.
Eyrick, Theodore B.; and Brown, Allen C., 3,932,066.

Chemie Linz Aktiengesellschaft: *See—*
Schonbeck, Rupert; Kloimstein, Engelbert; Mayr, Hubert; Diskus, Alfred; and Auer, Engelbert, 3,932,405.

Chen, Larry P.; and Wentworth, Theodore O., to Vulcan-Cincinnati, Inc. Urea manufacture. 3,932,504, Cl. 260-555.00A.

Chetelat, Fernand: *See—*
Scherrer, Igor; Chetelat, Fernand; and Hersberger, Pierre, 3,931,703.

Chevron Research Company: *See—*
Burrous, Merwyn L., 3,932,294.
King, John M.; and Bakker, Nicolaas, 3,932,289.
Kurkov, Victor P., 3,932,468.

Cheyney, Dan R., to Kaiser Aluminum & Chemical Corporation. Insulated tank. 3,931,908, Cl. 220-71.000.

Chicago Bridge & Iron Company: *See—*
Coers, Don Henry; and Sudduth, Jackie Wayne, 3,932,154.

Chicago Pneumatic Tool Company: *See—*
Schaedler, Raymond J., 3,932,071.

childers, Mark A.; and Dawkins, Enoch L., to Ocean Drilling & Exploration Company. Mooring method for deployment and retrieving of mooring lines. 3,931,782, Cl. 114-206.00R.

Chillingworth, Colin Andrew, to Perkins, Joan Mary; and Chillingworth, Glyn Andrew Frank. Milking machines. 3,931,794, Cl. 119-14.080.

Chillingworth, Glyn Andrew Frank: *See—*
Chillingworth, Colin Andrew, 3,931,794.

Chinuki, Takashi: *See*—
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,932,528.

Chisholm-Ryder Company, Inc.: *See*—
Burton, Charles G., 3,931,823.

Chromalloy American Corporation: *See*—
Raighn, Edwin H.; Eglinton, Robert B.; Frazier, Lorne L.; Naylor, Robert R.; and Morris, William R., 3,931,940.

Ciba-Geigy AG: *See*—
Fasciati, Alfred, 3,932,378.
Junod, Pierre, 3,932,292.
Ramanathan, Visvanathan, 3,932,122.

Ciba-Geigy Corporation: *See*—
Bohner, Beat; Dawes, Dag; and Meyer, Willy, 3,932,630.
Dawes, Dag; and Bohner, Beat, 3,932,629.
Gatzi, Karl, 3,932,509.
Habermeier, Juergen; and Porret, Daniel, 3,932,176.
Nachbur, Hermann; and Maeder, Arthur, 3,932,502.
Peter, Heinrich; Rodriguez, Herman Robert; and Bickel, Hans, 3,932,465.
Pickles, Wilfred; and Baylis, Eric Keith, 3,932,505.

Claassens, Johannes E. L.: *See*—
Schaafsma, Sijbrandus E.; Claassens, Johannes E. L.; and Verheijen, Egidius J. M., 3,932,511.

Clark Equipment Company: *See*—
Johns, Robert C., Jr., 3,931,687.

Clark, Wallace. Moineau pump with rotating outer member. 3,932,072, Cl. 418-48.000.

Clarke, Robert L.: *See*—
Shaw, Philip E.; Daum, Sol J.; and Clarke, Robert L., 3,932,482.

Clarks Limited: *See*—
Greensides, Christopher John, 3,931,680.

Clash, David G.: *See*—
Alberto, Vicente S.; and Clash, David G., 3,932,196.

Clear Air, Inc.: *See*—
Anderson, Grant L., 3,932,280.

Cleary, Michael, to Sumaspcae Limited. Highway construction. 3,932,051, Cl. 404-82.000.

Clementson, John Joseph; and Horvath, Arisztid Lajos, to Imperial Chemical Industries Limited. Solvent compositions for cleaning. 3,932,297, Cl. 252-171.000.

Clendinning, Robert A.; Potts, James E.; and Niegisch, Walter D., to Union Carbide Corporation. Blends of biodegradable thermoplastic dialkanoyl polymer, a naturally occurring biodegradable product, a plastic additive and a filler. 3,932,319, Cl. 260-7.500.

Coan, Richard L.: *See*—
Eggers, Frank W., III; Wigger, Ralph O.; and Coan, Richard L., 3,932,118.

Cobb, Raymond L., to Phillips Petroleum Company. Pyrolysis of N-substituted-1-cyclohexene-1,2-dicarboximides. 3,932,457, Cl. 260-326.00C.

Coel, Joseph B., to Badger Meter, Inc. Universal joint connector. 3,931,992, Cl. 285-30.000.

Coers, Don Henry; and Sudduth, Jackie Wayne, to Chicago Bridge & Iron Company. Refrigerant apparatus and process using multicomponent refrigerant. 3,932,154, Cl. 62-9.000.

Coffen, David Llewellyn; and Fryer, Rodney I., to Hoffmann-La Roche Inc. 2,5-Epithio-1,4-benzodiazepines. 3,932,399, Cl. 260-243.00R.

Cogar Corporation: *See*—
Brown, William A., 3,932,239.

Coggins, Leroy, to Cornell Research Foundation, Inc. Method and composition for the diagnosis of equine infectious anemia virus infection by using agar-gel-immunodiffusion reaction. 3,932,601, Cl. 424-12.000.

Cohen, Leonard George; and Schneider, Martin Victor, to Bell Telephone Laboratories, Incorporated. Fabrication of microlenses. 3,932,184, Cl. 96-38.300.

Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. 7,7a-Dihydro-4-[2-(3-alkoxyphenyl)-2-hydroxyethyl]-7a-alkyl-1, 5(6H)-indandiones,3,4,8,8a-tetrahydro-5-[2-(3-alkoxyphenyl)-2-hydroxyethyl]-8a-alkyl-1,6(7H)-naphthalenediones and processes for the preparation thereof utilizing asymmetric induction. 3,932,519, Cl. 260-590.000.

Cohen, Sam G., to Timex Corporation. Electro-optical display with circuitry for applying predetermined potentials to all display segments to effect activation of a selected segment only. 3,932,860, Cl. 340-324.00M.

Coherent Communications System Corporation: *See*—
Bodony, Andrew B., 3,932,704.

Coils, Inc.: *See*—
Plunkett, James P.; and Latchford, Joseph T., 3,932,828.

Coirre, Bertrand: *See*—
Coirre, Paul; Coirre, Bertrand; Denis, Jean-Claude; Rambaud, Jerome; and Cahn, Jean, 3,932,638.

Coirre, Paul; Coirre, Bertrand; Denis, Jean-Claude; Rambaud, Jerome; and Cahn, Jean, to Franco-Chimie S.a.r.l. Compositions and methods for wound healing. 3,932,638, Cl. 424-245.000.

Coleman, Edward H. Method and apparatus for styling synthetic wigs. 3,931,827, Cl. 132-56.000.

Coleman, Raymond C., to Xerox Corporation. Method for forming a collar. 3,932,177, Cl. 75-214.000.

Colgan, William B., to Raymond Lee Organization, Inc., The, a part interest. Aqua sled. 3,931,777, Cl. 114-16.00A.

Colgate-Palmolive Company: *See*—
Barth, Jordan B., 3,932,604.
Barth, Jordan B.; and Costello, Christopher H., 3,932,606.
Karami, Hamzeh, 3,931,666.

Collin, Per Harald; and Johansson, Folke Karl Evald, to Allmanna Svenska Elektriska Aktiebolaget. Inductially heated gas lift pump action method for melt reduction. 3,932,173, Cl. 75-93.00R.

Collings, Carlton S., Jr.: *See*—
Lavedan, Louis J., Jr.; and Collings, Carlton S., Jr., 3,932,823.

Collis, Raymond D.; and Meyer, Martin H., to Outboard Marine Corporation. Tilt position indicator. 3,931,784, Cl. 115-41.00R.

Comalco (J. & S.) Pty. Limited: *See*—
Jury, Harold Rex; and Hay, John Henry, 3,932,249.

Combinatul Chimic Fagaras: *See*—
Vilceanu, Marin; and Bors, Constantin, 3,932,139.

Combustion Engineering, Inc.: *See*—
Musick, Charles Ronald; and Torres, Jose Marcelo, 3,932,213.

Cominco Ltd.: *See*—
Howe, Fred Ellsworth, 3,932,284.

Commissariat a l'Energie Atomique: *See*—
Aubert, Michel; Gollion, Henri Jacques; and Verriere, Philippe, 3,932,214.

Communications Satellite Corporation (Comsat): *See*—
Allen, William Arthur, 3,931,953.

Compur-Werk Gesellschaft: *See*—
Singer, Franz, 3,932,893.

Comte, Georges N., to Cables de Lyon Alsacienne. Apparatus for semi-continuous production of lengthy helical wave guides. 3,932,254, Cl. 156-361.000.

Concast AG: *See*—
Schmid, Markus, 3,931,848.

Concorde Fibers, Inc.: *See*—
Patel, Pravin, 3,932,576.

Conforti, Frederick J.; and Mensing, Clifford E., to Pittway Corporation. Warning device. 3,932,850, Cl. 340-237.00S.

Conkling, William Collins; and Weber, Joseph Thomas, Jr., to Pennwalt Corporation. Pulsating liquid flow transmitter. 3,931,737, Cl. 73-209.000.

Conn, Richard H., to International Pharmakon Laboratories, Inc. Surgical skin scrub. 3,932,655, Cl. 424-317.000.

Connolly, David Charles Anthony; and Hovland, Per Jorgen. Electric impulse transmitters for telephone instruments. 3,932,707, Cl. 179-16.0AA.

Connor, David T.; Ringel, Samuel M.; and von Strandtmann, Maximilian, to Warner-Lambert Company. Ketones and ketoximes derived from acid S, an antibiotic produced by *polyangium cellulosum* var. *fulvum*. 3,932,620, Cl. 424-122.000.

Connor, David T.; and Ringel, Samuel M., to von Strandtmann, Max; and Warner-Lambert Company. Triols and acetates thereof derived from antibiotic substance, acid S, produced by polyangium cellulosum var. fulvum. 3,932,621, Cl. 424-122.000.

Constructions Edmond Coignet: *See*—
Fougea, Edouard Marie, 3,931,951.

Container Corporation of America: *See*—
Gardner, Jeffrey M.; and Pilz, William M., III, 3,931,924.

Continental Can Company, Inc.: *See*—
Pasternack, George; and Jondahl, Thor, 3,932,346.
Shaw, Fred B.; and Graumann, Richard E., 3,932,693.

Continental Charter Corporation: *See*—
Gomm, Thiel J.; and Price, Stephen E., 3,932,767.

Continental Oil Company: *See*—
McCain, David L., 3,931,999.
Petry, Eston F.; and Umphrey, Ronald W., 3,931,936.
Starks, Charles M., 3,932,552.

Controlled Environment Systems Inc.: *See*—
Widmayer, Don Frederick, 3,931,695.

Cook Electric Company: *See*—
Fleuchaus, Albert C.; and Shylo, Paul, 3,932,713.

Cook, Gordon Henry; and Fawcett, John Anthony, to Rank Organisation Limited, The. Beam splitting prism assembly. 3,932,027, Cl. 350-173.000.

Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, to Glaxo Laboratories Limited. Penicillins having a 6β-(α-etherified oximino) acylamido group. 3,932,385, Cl. 260-239.100.

Cook, Raymon W. Golf club. 3,931,975, Cl. 273-164.000.

Cooney, John R. Directional antenna. 3,932,875, Cl. 343-820.000.

Coop, Jackie Allen. Tear-off closure. 3,931,904, Cl. 215-254.000.

Cooper, Hugh S., deceased; and Rand, Henry J., executor. Process for producing alkali metal chromates and dichromates. 3,932,598, Cl. 423-596.000.

Coopmans, Jean-Paul: *See*—
Verheyen, Willy; Raes, Andre; Coopmans, Jean-Paul; and Lambert, Jean-Louis, 3,932,726.

Cope, Steven Andrew, to Du Pont de Nemours, E. I., and Company. Force resistant assembly. 3,931,993, Cl. 285-200.000.

Corey, Philip D., to ESB Incorporated. Transfer switch and transient eliminator system and method. 3,932,764, Cl. 307-85.000.

Cornell, Paul V.; and Lawlor, Robert E., to Electro Clamp Corporation. Tension energized cable clamp. 3,932,021, Cl. 339-266.00R.

Cornell Research Foundation, Inc.: *See*—
Coggins, Leroy, 3,932,601.
Finn, Robert K.; Tannahill, Alex L.; and Laptewicz, Joseph E., Jr., 3,932,218.

Corning Glass Works: *See*—
Blankenship, Michael G., 3,932,162.
Forker, Ray B., Jr.; and Panzarino, Joseph N., 3,932,681.

Cornwell, Lionel B. Controlled power transferring device and method utilizing a reactance controlled by development of opposing magnetic fluxes. 3,932,802, Cl. 323-6.000.

Corte, Francisco Barcelloni; and Bianco, Pablo. Rotary internal combustion engine. 3,931,809, Cl. 123-43.00R.

Costello, Christopher H.: *See—*
Barth, Jordan B.; and Costello, Christopher H., 3,932,606.

Cote, Yvon, to Bombarider Limited. Ski suspension for front of snowmobile. 3,931,862, Cl. 180-5.00R.

Cotterrell, Graham Paul, to Imperial Chemical Industries Limited. Certain organophosphorus compounds used to control insects. 3,932,631, Cl. 424-200.000.

Coulter Electronics, Inc.: *See—*
Ginsberg, Guenter; Godin, Thomas John; and Simpson, Ronald Olin, 3,932,065.

Coulter, Geoffrey Lionel: *See—*
Edwards, Reginald Harold; Coulter, Geoffrey Lionel; and Dodd, Alan Michael, 3,931,843.

Coutin, Pierre F.: *See—*
Guimier, Jacques A.; and Coutin, Pierre F., 3,932,714.

Cowell, David; and Ensslin, Frieder H., to Sybron Corporation. X-ray detector for a panoramic X-ray device. 3,932,756, Cl. 250-361.000.

Cox, David Lloyd; and McDonnell, Neil Patrick Hugh, to Imperial Chemical Industries Limited. Method of sealing fibers in apertures. 3,932,570, Cl. 264-69.000.

Cramer, Richard D.: *See—*
Bilofsky, Ruth C.; and Cramer, Richard D., 3,932,455.

Criterion Manufacturing Company, Inc.: *See—*
Krewalk, John J., Sr., 3,932,148.

Crites, Ray D.; Block, David A.; and Sidles, Paul H. Dryer for particulate material. 3,931,683, Cl. 34-169.000.

Croisant, Elmer E., to Brunswick Corporation. Oil circulating system for marine propulsion gear case. 3,931,783, Cl. 115-34.00R.

Crompton & Knowles Corporation: *See—*
Feeman, James F., 3,932,376.

Cross, Barrington; and Feeny, Richard William, to American Cyanamid Company. Substituted s-triazines as herbicidal agents. 3,932,167, Cl. 71-93.000.

Cross, Peter Edward; and Gadsby, Brian, to Pfizer Inc. 2 And 3-substituted-4-(heterocyclic-amino-sulfonyl)benzene sulfonamides as cerebral vasodilators. 3,932,636, Cl. 424-244.000.

Cross, Peter Edward; and Gadsby, Brian, to Pfizer Inc. 2 And 3-substituted-4-(heterocyclic-amino-sulfonyl)benzene sulfonamides as cerebral vasodilators. 3,932,639, Cl. 424-248.000.

Cross, Peter Edward; and Gadsby, Brian, to Pfizer Inc. 2 And 3-substituted-4-(heterocyclic-amino-sulfonyl)benzene sulfonamides as cerebral vasodilators. 3,932,649, Cl. 424-267.000.

Crossan, James. Connecting systems. 3,932,047, Cl. 403-186.000.

Crounse, Nathan N.; and Desai, Kantilal B., to Sterling Drug Inc. Stilbene optical brighteners and compositions brightened therewith. 3,932,301, Cl. 252-301.20W.

Crovetti, Aldo Joseph; Kenney, Donald Sykes; Lynch, Don Murl; and Stein, Robert George, to Abbott Laboratories. 4-Nitropyrazoles. 3,932,453, Cl. 260-310.00R.

Crovetti, Aldo Joseph: *See—*
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Crowell, Kenneth E.; and Brettman, William M., deceased (by Brettman, Donna M., administratrix), to Motorola, Inc. Sealed switch actuator. 3,932,721, Cl. 200-302.000.

CTS Corporation: *See—*
Van Benthuysen, John D., 3,932,832.

Culpepper, Clifford, Jr., to Aero-Dyne Manufacturing, Inc. Burner with automatic high-low operation. 3,932,137, Cl. 23-277.00C.

Cure, Ronald William Lewis: *See—*
Vincent, Alan Henry; and Cure, Ronald William Lewis, 3,932,060.

Curran, William Vincent; Tomcufcik, Andrew Stephen; and Ross, Adma Schneller, to American Cyanamid Company. P-(1H-tetrazol-1-yl)-phenylcarbamates. 3,932,440, Cl. 260-308.00D.

Curtiss-Wright Corporation: *See—*
Jones, Charles, 3,932,075.

Cutting, Alan Butler, to E M I - Varian Limited. Tunable coaxial magnetrons. 3,932,787, Cl. 315-39.610.

Czerner, Peter A.; Daniels, John F.; Melito, Maurice A., Jr.; and Szymansky, Edward, to Sperry Rand Corporation. Electric dry shaver with releasable cutter head. 3,931,675, Cl. 30-41.600.

Czerniejewski, Francis R., to Westinghouse Electric Corporation. System and method for xenon acceleration in training simulator for nuclear power plant. 3,932,885, Cl. 444-1.000.

Czyryk, Chester S., to Mangood Corporation. Low-profile platform scale. 3,931,860, Cl. 177-257.000.

D. Swarovski & Co., Glasschleiferei: *See—*
Schwab, Kurt, 3,931,719.

Dabby, Franklin Winston: *See—*
Camlibel, Irfan; Dabby, Franklin Winston; Pinnow, Douglas Arthur; and Van Uitert, LeGrand Gerard, 3,932,160.

Dahlman, Inc.: *See—*
O'Hare, Edward C.; and DeVries, Wallace J., Sr., 3,931,857.

Dai-Ichi Kogyo Seyaku Co. Ltd.: *See—*
Maki, Hirohisa; and Kitagawa, Yozo, 3,932,321.

Dai Nippon Toryo Kabushiki Kaisha: *See—*
Yaguchi, Masachika; and Furuta, Shigetaro, 3,932,024.

Daicel Ltd.: *See—*
Kamosaki, Minoru; and Asai, Sigel, 3,932,340.

Daigle, Donald J.; Pepperman, Armand B., Jr.; and Boudreaux, Gordon J., to United States of America, Agriculture. 2-Thia-1,3,5-triaza-7-phosphaadamantane 2,2-dioxide. 3,932,390, Cl. 260-243.00R.

Daihatsu Motor Company Limited: *See—*
Nagamitsu, Toshiaki, 3,931,989.

Daimler-Benz Aktiengesellschaft: *See—*
Beeskow, Bruno; Worner, Gunter; and Schrape, Peter, 3,931,876.

Dainippon Jochugiku Kabushiki Kaisha: *See—*
Katsuda, Yoshio, 3,932,470.

D'Albignac, Jean Marie Louis Jules, to Groupement d'Interet Economique Stx. Dyeing textile materials of a basic character. 3,932,127, Cl. 8-173.000.

Dalli, Alan George; Debenham, Michael; and Shackleford, Ralph Edward, to Broken Hill Proprietary Company, Ltd., The. Push-in easy-opening closures. 3,931,909, Cl. 220-268.000.

Damon, Lionel; and Scoffield, Brian Philip, to British Secretary of State for Defense, The. Crossed field amplifiers. 3,932,820, Cl. 330-43.000.

Daniels, John F.: *See—*
Czerner, Peter A.; Daniels, John F.; Melito, Maurice A., Jr.; and Szymansky, Edward, 3,931,675.

Danzer, Joseph; and Weber, Helmut, to Wacker-Chemie GmbH. Method of insulating rotor plates. 3,932,691, Cl. 428-450.000.

Dashew, Stephen S., to Interform, Inc. Multiple concrete form apparatus. 3,931,952, Cl. 249-177.000.

Datron Systems, Inc.: *See—*
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Daum, Sol J.: *See—*
Shaw, Philip E.; Daum, Sol J.; and Clarke, Robert L., 3,932,482.

Daunay, Jacques: *See—*
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David Brown Tractors Limited: *See—*
Ashfield, Herbert Edward; and Hull, Charles Hartley, 3,931,812.

Davis, Gerald T.; and Fetters, Robert A., to Mead Corporation, The. Reactant sheet for developing colorless dye images. 3,932,695, Cl. 428-531.000.

Davis, Paul, to Sweetheart Plastics, Inc. Stackable lid. 3,931,890, Cl. 206-508.000.

Davis, Ralph A.; Tigner, Ronald G.; Pedjac, Joseph J.; and Peterson, Laurence I., to Dow Chemical Company, The. Process for the preparation of brominated pentaerythritols. 3,932,541, Cl. 260-633.000.

Davison, Richard R.: *See—*
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Dawes, Dag; and Bohner, Beat, to Ciba-Geigy Corporation. Triazolyl phosphorus esters as pesticides. 3,932,629, Cl. 424-200.000.

Dawes, Dag: *See—*
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Dawkins, Enoch L.: *See—*
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Debenham, Michael: *See—*
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de Bruyn, Gerrit C.: *See—*
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DeCaro, Aristide R.; Murphy, Eugene F.; and Maynard, Billy A., to Westinghouse Electric Corporation. Electric lamp having an envelope with a specular light-reflective coating of oriented aluminum particles. 3,932,780, Cl. 313-113.000.

Dechelette, Helen, to AMP Incorporated. Electrical terminal assembly and terminal therefor. 3,932,017, Cl. 339-97.00P.

de Cleur, Eckhard; Dhein, Rolf; Rudolph, Hans; and Kreuder, Hans Joachim, to Bayer Aktiengesellschaft. Pulverent coating materials containing polyoxazolines and polyesters based on succinic anhydride. 3,932,358, Cl. 260-75.00N.

DeCoursey, Leonard T., to John Mohr & Sons. Method for treating tobacco. 3,931,825, Cl. 131-140.00A.

Deere & Company: *See—*
Cheatum, Leo George, 3,931,760.
Dobberpuhl, Dale Rudolph, 3,931,745.
Soteropulos, Gust; and Meiers, Gerald Franklyn, 3,931,702.
Woods, Terrill Wayne, 3,932,252.

Deerfield, Alan J.; and Nissen, Stanley M., to Raytheon Company. Bus controller for digital computer system. 3,932,841, Cl. 340-172.500.

Deering Milliken Research Corporation: *See—*
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DeGregory, Donald Lee, to Bell Telephone Laboratories, Incorporated. Fluidic device. 3,931,833, Cl. 137-829.000.

Delepine, Pierre, to Thomson-CSF. Spectrum analyzer establishing a nonlinear frequency distribution of power-density spectra. 3,932,737, Cl. 235-152.000.

DeLong, Robert J.: *See—*
Shirley, Ronald A.; and DeLong, Robert J., 3,932,831.

Delplanque, Fernand, to Mecaval International. Vise for bias-cutting sawing machines. 3,931,962, Cl. 269-55.000.

Delplanque, Fernand: *See—*
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Den-Tal-Ez Mfg., Co.: *See—*
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Denis, Jean-Claude: *See—*
Coirre, Paul; Coirre, Bertrand; Denis, Jean-Claude; Rambaud, Jerome; and Cahn, Jean, 3,932,638.

Dennison Manufacturing Company: *See—*
Merser, Francis G.; and Kooistra, Philip A., 3,931,667.

de Putter, Warner Jan, to Wavin B.V. Device for the supply and discharge of cooling liquid in the worms of an extruder press. 3,931,853, Cl. 165-87.000.

Dereng, Viggo G. Parachute canopy testing apparatus. 3,931,734, Cl. 73-147.000.

De Roeck, Lucien Joannes Maria: *See—*
Peeters, Jozef C. I.; De Roeck, Lucien Joannes Maria; and Van Boort, Henricus Johannes Joseph, 3,932,781.
Desai, Kantilal B.: *See—*
Crounse, Nathan N.; and Desai, Kantilal B., 3,932,301.
Desbarats, William Edouard. Air sustension propulsion. 3,931,864, Cl. 180-116.000.
De Torre, John, to Federal Pacific Electric Company. Current limiting circuit breaker system. 3,932,825, Cl. 335-8.000.
Detprotector, Inc.: *See—*
Sons, James E.; and Starnes, Wayne C., 3,932,789.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
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Deutsche Vergaser GmbH & Co. Kommanditgesellschaft: *See—*
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Deuzeman, Hendrik H. J.; Lumley, Norman; and Santos, Ruben A. Calcia catalyzed resins. 3,932,334, Cl. 260-29.300.
Deviny, Edward John: *See—*
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de Vries, Gerbertus H.; and de Bruyn, Gerrit C., to Stork Werkspoor Sugar B.V.; and Suiker Unie Holding B.V. Serial flow crystallization at linearly decreasing pressures. 3,932,142, Cl. 23-301.000.
DeVries, Wallace J., Sr.: *See—*
O'Hare, Edward C.; and DeVries, Wallace J., Sr., 3,931,857.
Dhein, Rolf: *See—*
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Diamond, Martin J.: *See—*
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Freedman, Bernard; and Diamond, Martin J., 3,932,352.
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Dickopp, Gerhard; and Jahnel, Benno, to TED Bildplatten Aktiengesellschaft, AEG-Telefunken, TELDEC. Record disc foil support system with charge leakage means. 3,932,710, Cl. 179-100.40R.
Diem, Hans: *See—*
Seither, Karl; Matthias, Guenther; Diem, Hans; Hussy, Oskar; and Haas, Hans, 3,932,522.
Dien, Sam. Golf glove improvement. 3,931,647, Cl. 2-161.00A.
Dierckx, Jozef Aime: *See—*
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Difflipp, Kurt: *See—*
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Dike, Robert S.; and Kewish, Ralph W., Jr., to United States of America, Energy Research and Development Administration. High-explosive driven crowbar switch. 3,932,717, Cl. 200-61.080.
Director-General of the Agency of Industrial Science and Technology: *See—*
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Yoshida, Hisayoshi; Nakamura, Takato; Nakagawa, Masanao; Arita, Seiji; and Miki, Toshiharu, 3,932,494.
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Dissett, Walter L., to Aspro, Inc. Reversible overrunning clutch with automatic shift control and friction reducing means. 3,931,872, Cl. 192-43.000.
Di Stefano, Vittorio; Grimaldi, Rinaldo; and Marini, Paolo, to Centro Sperimentale Metallurgico S.p.A. Method and apparatus for the determination of the oxygen content of metallic baths. 3,932,135, Cl. 23-253.00R.
Disteldorf, Josef: *See—*
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Dittmann, Larry Eugene, to AMP Incorporated. Terminal locator and retainer device. 3,931,671, Cl. 29-203.0DT.
Dixon, Tracy W. Tire changing device. 3,931,845, Cl. 157-1.220.
Dobberpuhl, Dale Rudolph, to Deere & Company. Tensioning device for a flexible drive element. 3,931,745, Cl. 74-242.11S.
Dr. -Ing. H.c.F. Porsche Aktiengesellschaft: *See—*
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Dodd, Alan Michael: *See—*
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Doherty, George O. P., to Eli Lilly and Company. 1H-imidazo(4,5,-b)-pyridine derivatives. 3,932,428, Cl. 260-295.00F.
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Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,932,528.
Doi, Tadashi; Sekido, Isao; and Tamaki, Ryoichi, to Kao Soap Co., Ltd. Method for rapid hardening of asphalt emulsions. 3,932,331, Cl. 260-28.000.
Doin, Bernard Jean Felix Victor; Grebert, Robert Omer Emmanuel; and Jouhaud, Yves Pierre, to Societe Nationale des Poudres et Explosifs. Method of loading a solid fuel rocket engine. 3,931,709, Cl. 60-255.000.
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Domergue, Annick Marthe Suzanne Simone; Sureau, Robert Frederic Michel; Leboulenger, Jean Ernest Etienne; and Houssin, Jean Marie Alfred, to Products Chimiques Ugine Kuhlmann. Process for the preparation of 4'-alkoxy-4-naphthalimido-pyrazolium compounds and intermediates therefor. 3,932,413, Cl. 260-270.00H.
Dominion Glass Company Limited: *See—*
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Donohue, Paul C., to Du Pont de Nemours, E. I., and Company. Preparation and doping of semiconducting forms of $CuAlS_2$. 3,932,291, Cl. 252-62.30V.
Dopera, Rudolph. Stringed musical instruments. 3,931,753, Cl. 84-296.000.
Dorn, Gordon L., to J. K. & Susie L. Wadley Research Institute and Blood Bank. For isolating pathogenic microorganisms. 3,932,222, Cl. 195-127.000.
Douglas, Paul S.; Patellis, Anargiros Pete; and Vredenburgh, Walter A., to Hercules Incorporated. Copolymers of alpha-methylstyrene and styrene and uses thereof. 3,932,332, Cl. 260-28.50A.
Dovgan, Vladimir Semenovich: *See—*
Berdyansky, Mark Grigorievich; Khodak, Zarislav Zakharovich; Veevnik, Vladimir Fomich; Dovgan, Vladimir Semenovich; Bashkatov, Vladimir Porfirievich; Kasyan, Vladimir Khrisanfovich; Bezkrovny, Konstantin Fedorovich; and Tsekhnovich, Lev Izrailevich, 3,931,724.
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Downings, Harvey T.; and Sturgis, Byron E., to Micromedic Systems, Inc. Liquid-containing cartridge and a device for dispensing measured amount of liquid from such a cartridge. 3,931,915, Cl. 222-327.000.
Doyle, William C., Jr.; and Hedrich, Loren W., to Gulf Research & Development Company. Multistep synthesis for certain 1,3,4-thiadiazoles and intermediate. 3,932,437, Cl. 260-306.80D.
Drager, Achim: *See—*
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Duembgen, Gerd; Engelbach, Heinz; Frey, Walter; Krabetz, Richard; Lebert, Ulrich; Spitzl, Hermann; Thiessen, Fritz; and Willersinn, Carl-Heinz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Recovering anhydrous acrylic acid. 3,932,500, Cl. 260-526.00N.
Dunbar Manufacturing Co., Inc.: *See—*
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Duncan, Lloyd P. Pulsating teat cups. 3,931,795, Cl. 119-14.380.
Dunlay, John B.; and Howard, Robert C., to Thermo Electron Corporation. Cold fuel thermionic converter. 3,932,776, Cl. 310-4.000.
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Duquenne, Claude, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Magnetically controlled obturator. 3,931,976, Cl. 277-80.000.

Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories, Inc. Pyridyl substituted aminoalkyl-thioureas and ureas. 3,932,427, Cl. 260-294.80H.

Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories, Inc. H2 histamine receptor inhibitors. 3,932,644, Cl. 424-263.000.

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Eaton Corporation: *See—*
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Ebauches S.A.: *See—*
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Ebersold, Robert C., to Warner & Swasey Company, The. Center guided crane boom. 3,931,698, Cl. 52-118.000.

Ebert, Edward A. Device for heating thermoplastic eyeglass frames. 3,932,114, Cl. 432-5.000.

Echlin Manufacturing Company, The: *See—*
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Eck, Herbert; Muller, Frank; and Wihrheim, Sven E., to Wacker-Chemie GmbH. Pyrimidines and process of making the same. 3,932,408, Cl. 260-256.40N.

Eckert, Konrad, to Robert Bosch G.m.b.H. Fuel injection system for internal combustion engines. 3,931,802, Cl. 123-139.0AW.

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Edge, Charles K.; and Kunkle, Gerald E., to PPG Industries, Inc. Method and apparatus for forming a ribbon of glass on a bath of molten metal. 3,932,165, Cl. 65-65.00A.

Edwards, Reginald Harold; Coulter, Geoffrey Lionel; and Dodd, Alan Michael, to Dunlop Limited. Pneumatic tires. 3,931,843, Cl. 152-330.00L.

Eggemann, Robert V., to United States of America, Energy Research and Development Administration. Aluminum for bonding Si-Ge alloys to graphite. 3,931,673, Cl. 29-573.000.

Eggers, Frank W., III; Wigger, Ralph O.; and Coan, Richard L., to Cerro Corporation. Insulation removal apparatus. 3,932,118, Cl. 432-58.000.

Eggler, James F.: *See—*
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Electrostatic Research Corporation: *See—*
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Elkins, Johnny C.; and Hanz, Marvin C. Rifle mounting rack for sliding window assemblies. 3,931,893, Cl. 211-64.000.

Ellenberger, Jakob, to Ellenberger & Poensgen GmbH. Excess current switch. 3,932,829, Cl. 337-49.000.

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Ellis, Robert C.; Vance, James C., Sr.; Van Gundy, Sterling; and Walcher, Donald R., to Gates Rubber Company, The. Apparatus for manufacturing power transmission belting. 3,932,078, Cl. 425-28.00B.

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Erb, Edward R.; and Maass, Richard L., to GAF Corporation. Mechanical embossing of foamed sheet material. 3,932,245, Cl. 156-79.000.

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Eron, Robert E. Foam generator. 3,932,302, Cl. 252-359.00E.

Erspamer, James R., to Sperry Rand Corporation. Gyroscopic stable reference device. 3,931,747, Cl. 74-5.340.

ESB Incorporated: *See—*
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Esmond, William G. Fluid exchange device. 3,932,283, Cl. 210-321.000.

Esper, Michael J.: *See—*
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Etchells, John L.; Bell, Thomas A.; Fleming, Henry P.; and Thompson, Roger L., to United States of America, America. Controlled bulk vegetable fermentation. 3,932,674, Cl. 426-52.000.

Ethyl Corporation: *See—*
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Hornbaker, Edwin D.; and Sparks, Bryan, 3,932,336.
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Evans, James P. Reversible self-retaining ratcheting wrench. 3,931,749, Cl. 81-119.000.

Evans, Leslie Samuel; and Harbar, John Richard, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Industry in Her Britannic Majesty's Government of the. Electric cells. 3,932,195, Cl. 136-6.0FS.

Evans, Lyle B. Washing apparatus for vehicles. 3,931,658, Cl. 15-4.000.

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Fader, John H.; Keijzer, Johan H.; Graulus, Marcel J. R.; and Beets, Roland H. C., to Monroe Belgium N.V. Shock absorber. 3,931,961, Cl. 267-64.00R.

Fagel, Roger, to Ateliers de Constructions Electriques de Charleroi (ACEC). Braking device for railroad bogie running at high speed. 3,931,869, Cl. 188-41.000.

Fairchild Camera and Instrument Corporation: *See—*
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Fallotico, John. Jack type adaptor. 3,932,019, Cl. 339-176.00M.

Fang, Shou-Mean; and Hof, Craig R., to Bio-Medical Sciences, Inc. Time-temperature integrating indicator device. 3,932,134, Cl. 23-253.0TP.

Fantozzi, Louis John, to Xerox Corporation. Control circuit for switching triacs. 3,932,770, Cl. 307-252.0UA.

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Feeman, James F., to Crompton & Knowles Corporation. Sulfo phenyl-azo-sulfo phenyl-azo-alkoxy-diphenyl compounds. 3,932,376, Cl. 260-186.000.

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Fenyes, Joseph G. E.; and Flanagan, Kenneth J., to Buckman Laboratories, Inc. Phosphonic acid half-esters and their derivatives. 3,932,478, Cl. 260-429.700.

Fernandez, Piedad Amezua. Doxycycline aceturate. 3,932,490, Cl. 260-501.110.

Ferranti, Limited: *See—*
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Fiala, Ernst: *See—*
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Finn, Robert K.; Tannahill, Alex L.; and Laptewicz, Joseph E., Jr., to Cornell Research Foundation, Inc. Production of heteropolysaccharide by fermentation of methanol. 3,932,218, Cl. 195-49.000.

Fischer, Roman: *See—*
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Fisher, Mahlon B.; Gallaro, Anthony V.; and Williams, G. Norman, to GTE Sylvania Incorporated. Process for fabricating an improved cathode ray tube screen structure. 3,932,183, Cl. 96-36.100.

Fitch, Clifford E., Jr.: *See—*
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Fitch, Clifford E., Sr.: *See—*
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Flatland, Lloyd P. Vacuum turbine for a drill. 3,932,055, Cl. 415-131.000.

Fleming, Henry P.: *See—*
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Albrecht, William L.; and Fleming, Robert W., 3,932,456.

Fleuchaus, Albert C.; and Shylo, Paul, to Cook Electric Company. Induction cancellation circuit. 3,932,713, Cl. 179-174.000.

Fleury, Jean-Pierre Louis, to Pechiney Ugine Kuhlmann. Process for making pyrazines from 2-aza-1,3-butadienes. 3,932,404, Cl. 260-250.0BC.

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Fogel, Wesley Samuel, to Dominion Glass Company Limited. Article carrier. 3,931,888, Cl. 206-434.000.

Foley, Kevin M.; and McCombs, Frank P., to Owens-Corning Fiberglas Corporation. Binder composition. 3,932,686, Cl. 428-268.000.

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Foote, Owen L., to Sperry Rand Corporation. FM/CW surveillance radar system with range gating. 3,932,871, Cl. 343-5.0PD.

Ford, Harold L.; Levine, Nathan M.; and Risdon, Alan Robert, to Stein, Hall & Co., Inc. Filtration aids in uranium ore processing. 3,932,276, Cl. 210-54.000.

Ford Motor Company: *See—*
Camelon, Melville J.; and Gibeau, Rodney C., 3,932,320.
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Fordice, Michael W.: *See—*
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Fork, Frank W.; Lindner, Robert G.; Kelly, Charles J.; and Albrecht, Raymond E., to H. H. Robertson Company. Underfloor access housing utilizing a trough space of a cellular flooring unit. 3,932,696, Cl. 174-48.000.

Forker, Ray B., Jr.; and Panzarino, Joseph N., to Corning Glass Works. Ceramic masking method. 3,932,681, Cl. 427-282.000.

Forster, Herbert: *See—*
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Foster Wheeler Energy Corporation: *See—*
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Fougea, Edouard Marie, to Constructions Edmond Coignet. Mobile pallet for an installation for production of pre-fabricated elements of concrete. 3,931,951, Cl. 249-158.000.

Foulke, Willing B. Fuel preparation process. 3,932,145, Cl. 44-1.00R.

Foundation: The Research Institute of Electric and Magnetic Alloys, The: *See—*
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Frank, Kjell; and Thorborg, Kjeld, to Allmanna Svenska Elektriska Aktiebolaget. Peak load levelling system. 3,932,799, Cl. 321-27.00R.

Frank, Kjell, to Allmanna Svenska Elektriska Aktiebolaget. Power factor correcting means. 3,932,808, Cl. 323-102.000.

Frank, Lee F., to Eastman Kodak Company. Deflector galvanometer. 3,932,809, Cl. 324-96.000.

Franklin, William E.; and Rowland, Stanley P., to United States of America, Agriculture. High-molecular weight acidic polymers. 3,932,560, Cl. 260-851.000.

Franz, Helmut, to PPG Industries, Inc. Angled crossfire rinses. 3,931,790, Cl. 118-73.000.

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Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees of the Stoneleigh Trust u/d/t Dec. 4, 1973: *See—*
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Frederick, Leonard L. Dynamic force measuring instrument for foundation pile and casing. 3,931,729, Cl. 73-11.000.

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Freedman, Bernard; and Diamond, Martin J., to United States of America, Agriculture. Photodegradable plastics containing β-halophenyl ketones. 3,932,338, Cl. 260-32.80A.

Freedman, Bernard; and Diamond, Martin J., to United States of America, Agriculture. Photodegradable plastic composition containing a N-halo imide. 3,932,352, Cl. 260-45.80N.

Freiberg, Leslie Alan, to Abbott Laboratories. 9-Dihydroniddamycin A compounds and related 3-(O)-esters and the process for their preparation. 3,932,383, Cl. 260-210.0AB.

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French, George F. Elastic check valve and method of construction. 3,931,831, Cl. 137-525.000.

Freudenschuss, Otto; Krammer, Herbert; and Scheiber, Robert, to Vockenhuber, Karl; and Hauser, Raimund. Load-control system responsive to operating condition of producer of intermittent radiation. 3,932,742, Cl. 250-199.000.

Frey, Donald G., to Westinghouse Electric Corporation. Pulsed polarization device for measuring angle of rotation. 3,932,039, Cl. 356-138.000.

Frey, Walter: *See—*
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Friedman, Herman H.; Halik, Linda K.; and Schwarz, Milton H., to General Foods Corporation. Skin moisturizer. 3,932,622, Cl. 424-168.000.

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Fujii, Setsuro; Otsuka, Masatomi; and Osaki, Yoshiyasu, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Anti-inflammatory compositions. 3,932,618, Cl. 424-94.000.

Fujii, Toshihiro: *See—*
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Fujino, Takashi; and Matsui, Riyouichi, to Kao Soap Co., Ltd. Detergent composition. 3,932,295, Cl. 252-102.000.

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Fukuda, Akira. Flux meter. 3,931,731, Cl. 73-40.000.

Fukuda, Masaaki: *See—*
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Fukumi, Hirokazu; Itoh, Koryo; Usubuchi, Yutaka; and Itoh, Hirataka, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing 4-aminomethyl cyclohexane carboxylic acid-1. 3,932,497, Cl. 260-514.00J.

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Fukunaga, Yasuhisa; and Okada, Akira, to Kyowa Kagaku Kogyo Kabushiki Kaishi. Process for hydrogenation reaction of unsaturated organic compounds. 3,932,534, Cl. 260-618.00H.

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Fukushima, Nobuo; Inoue, Masakazu; Takai, Ryouzo; and Hotta, Kozo, to Sumitomo Chemical Company, Limited; and Yomiuri Shimbun, The. Method for preparing a plastic relief printing plate. 3,931,762, Cl. 101-401.100.

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Fukuyasu, Fuguaki: *See—*
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Fulton, Robert W., to Morton-Norwich Products, Inc. Method for prolonging the inhibitory effect of saralasin on angiotensin II. 3,932,624, Cl. 424-177.000.

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Fuss, Gunter G., to Free-Flow Packaging Corporation. Method for producing free-flow interlocking foamed packing material. 3,932,569, Cl. 264-51.000.

Futaki, Kiyoshi; Tsukahara, Hirokazu; and Emoto, Kazuhiro, to Mitsubishi Paper Mills, Ltd. An organic photoconductive composition comprising an organic photoconductive compound and a sensitizing compound having an active methylene group. 3,932,182, Cl. 96-1.600.

Futaki, Kiyoshi: *See—*
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Gadd, Ronald O. C.; Quarmby, Robert C.; and Smith, Frank R., to USM Corporation. Adhesive extruding nozzle-guidance arrangements. 3,931,788, Cl. 118-8.000.

Gade, John J.: *See—*
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Cross, Peter Edward; and Gadsby, Brian, 3,932,649.

GAF Corporation: *See—*
Erb, Edward R.; and Maass, Richard L., 3,932,245.

Gaigg, Wilhelm; and Gutalj, Vladimir, to Sprecher & Schuh AG. Gas-blast insulated, encapsulated high-voltage switching installation with removable collecting rails. 3,932,720, Cl. 200-148.00R.

Gaku, Morio: *See—*
Sato, Shunichi; Kurata, Masaharu; Takao, Toshiyuki; Masaki, Sadao; Notomi, Toru; Gaku, Morio; and Moriya, Takehiko, 3,932,250.

Gallant, George A., to Simmonds Precision Products, Inc. Eddy current sensor. 3,932,813, Cl. 324-164.000.

Gallaro, Anthony V.: *See—*
Fisher, Mahlon B.; Gallaro, Anthony V.; and Williams, G. Norman, 3,932,183.

Galvin, Aaron A.: *See—*
Shapiro, L. Dennis; and Galvin, Aaron A., 3,932,870.

Ganellin, Charon Robin: *See—*
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 3,932,427.
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 3,932,644.

Ganowski, Franz-Josef, to Keller & Knappich Augsburg Zweignieder-lassung der Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Method for monitoring and regulating electrical resistance welding. 3,932,725, Cl. 219-110.000.

Garcia, Arthur, to RCA Corporation. Shortened aperture dipole antenna. 3,932,873, Cl. 343-792.000.

Garden State Paper Co., Inc.: *See—*
Illingworth, Robert H.; and Lorey, Frank W., 3,932,206.

Gardner, Jeffrey M.; and Pilz, William M., III, to Container Corporation of America. Erectable partition. 3,931,924, Cl. 229-28.00R.

Garone, Frank: *See—*
Rosenstreich, Joseph; Gubernick, Joseph; and Garone, Frank, 3,932,609.

Garr, Leo: *See—*
Fabian, James M., 3,931,972.

Garshelis, Ivan J. Magnetoelastic, remanent, hysteretic devices. 3,932,112, Cl. 431-255.000.

Gates, Eric: *See—*
Stratton, John Frederick; Haddow, Thomas; and Gates, Eric, 3,931,932.

Gates Rubber Company, The: *See—*
Ellis, Robert C.; Vance, James C., Sr.; Van Gundy, Sterling; and Walcher, Donald R., 3,932,078.

Gattersleben, Anneliese: *See—*
Jabs, Hartmut; and Wiemers, Minny, 3,931,750.

Gattersleben, Hermann: *See—*
Jabs, Hartmut; and Wiemers, Minny, 3,931,750.

Gatzi, Karl, to Ciba-Geigy Corporation. Carbamoyloximes derivatives. 3,932,509, Cl. 260-566.0AC.

Gauthier, George J., to Pfizer Inc. Phenanthridines and phenanthridinones as antiviral agents. 3,932,643, Cl. 424-258.000.

Gebhardt, Karl, to U.S. Philips Corporation. Method of manufacturing miniature incandescent lamps. 3,932,164, Cl. 65-32.000.

Gehri, Dennis C.: *See—*
Grantham, LeRoy F.; Gehri, Dennis C.; and Katz, Bruno, 3,932,587.

Geiger, William J.: *See—*
Jerabek, Robert D.; and Geiger, William J., 3,932,191.

Gendron, Normond. System to convert liquid fuel to gas. 3,931,800, Cl. 123-133.000.

General American Transporation Corporation: *See—*
Price, Albert E.; and Mowatt-Larssen, Erling, 3,931,768.

General Electric Company: *See—*
Sitter, David N., 3,932,838.
Vdoviak, John William, 3,931,707.
Welch, Stanley B., 3,932,849.
Yahraus, Theodor G., 3,932,050.

General Foods Corporation: *See—*
Friedman, Herman H.; Halik, Linda K.; and Schwarz, Milton H., 3,932,622.
Haas, Gerhard J., 3,932,603.
Main, Duane C., 3,932,675.

General Mills, Inc.: *See—*
Anderson, Ray H.; and Saari, Albert L., 3,932,608.

General Motors Corporation: *See—*
Memmer, James A., 3,931,870.
Scott, William B., 3,932,061.
Townsend, Peter G., 3,932,765.

General Teletronics Incorporated: *See—*
Hoff, Don G.; and Young, Patrick, 3,932,709.

General Tire & Rubber Company, The: *See—*
Proudfit, James R., 3,932,107.

Generale Alimentaire: *See—*
Hureau, Jean-Claude; Rota, Benjamin; and Thomas-Castelnau, Philippe, 3,932,092.

George, Flint R.: *See—*
Vann, Roy R.; and George, Flint R., 3,931,855.

Georgoudis, Paul C.: *See—*
Ray-Chaudhuri, Dilip K.; Georgoudis, Paul C.; and Stockmann, Hans H., 3,932,181.

Gerber, Gary A.; and Benson, Kenneth R. Bicycle carrier for automobiles. 3,931,919, Cl. 224-42.10F.

Gerns, Fred R., to Great Lakes Chemical Corporation. Process for preparation of 2,5-dibromo-p-xylene. 3,932,542, Cl. 260-650.00R.

Gersbeck, Rolf: *See—*
Brinkman, Heinz; Gersbeck, Rolf; and Greten, Berndt, 3,932,258.

Gertsch AG: *See—*
Kubelka, Axel, 3,931,982.

Gesellschaft fur Kernforschung m.b.H.: *See—*
Burgkhardt, Bertram; and Piesch, Ernst, 3,932,758.
Moser, Herbert, 3,932,762.
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Gettwart, Michael: *See—*
Henning, Wolfram; and Gettwart, Michael, 3,932,022.

Giardini, Dante S.; and Unnewehr, Lewis E., to Ford Motor Company. Variable reluctance motor pump. 3,932,069, Cl. 417-420.000.

Gibeau, Rodney C.: *See—*
Camelon, Melville J.; and Gibeau, Rodney C., 3,932,320.
Camelon, Melville J.; and Gibeau, Rodney C., 3,932,347.
Camelon, Melville J.; and Gibeau, Rodney C., 3,932,348.
Camelon, Melville J.; and Gibeau, Rodney C., 3,932,349.

Gibson, John Philip: *See—*
Chalmers, Brian John; and Gibson, John Philip, 3,932,798.

Gilbert, Robert L., Jr., to United States of America, Army. Electrical connectors. 3,932,020, Cl. 339-177.00R.

Gillette Company, The: *See—*
Hsiung, Du Yung, 3,931,912.

Gilpatrick, Michael William, to Deering Milliken Research Corporation. Loop pile fabric cutting module. 3,931,669, Cl. 26-9.000.

Ginsberg, Guenter; Godin, Thomas John; and Simpson, Ronald Olin, to Coulter Electronics, Inc. Pneumatically controlled liquid transfer system. 3,932,065, Cl. 417-317.000.

Giras, Theodore C., to Westinghouse Electric Corporation. Method of controlling supply of power. 3,932,735, Cl. 235-151.210.

Girault, Pierre: *See—*
Perronnet, Jacques; and Girault, Pierre, 3,932,447.

Givaudan Corporation: *See—*
Brandman, Harold A.; Manowitz, Milton; and Newman, William E., 3,932,654.
Naegeli, Peter, 3,932,517.
Shaffer, Gary W.; Kitchens, Garry C.; and Kaiser, Kent, 3,932,515.
Shaffer, Gary W.; Kitchens, Garry C.; and Kaiser, Kent, 3,932,516.

Glaverbel-Mecaniver S.A.: *See—*
Verheyen, Willy; Raes, Andre; Coopmans, Jean-Paul; and Lambert, Jean-Louis, 3,932,726.

Glaxo Laboratories Limited: *See—*
Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, 3,932,385.

Gliemeroth, Georg, to Jenaer Glaswerk Schott & Gen. Transparent, phototropic laminate. 3,932,690, Cl. 428-432.000.

Globe-Union Inc.: *See—*
Rinnert, Helmut Kurt, 3,931,840.

Gloyer, Stewart E.; and Fury, Lawrence A., to Kraftco Corporation. Process for manufacture of ketones from olefins. 3,932,521, Cl. 260-597.00B.

Godin, Thomas John: *See—*
Ginsberg, Guenter; Godin, Thomas John; and Simpson, Ronald Olin, 3,932,065.

Goetz, Norbert; and Fischer, Roman, to BASF Aktiengesellschaft. Manufacture of unsaturated ketones. 3,932,462, Cl. 260-340.700.

Goldfarb, Adolph E.; and Benkoe, Erwin. Air table game apparatus. 3,931,974, Cl. 273-126.00R.

Goldowsky, Michael. Liquid administration apparatus. 3,931,818, Cl. 128-214.00C.

Goldsberry, Fred L., to Enserch Corporation. Refrigerant expander compressor. 3,932,159, Cl. 62-510.000.

Gollion, Henri Jacques: *See—*
Aubert, Michel; Gollion, Henri Jacques; and Verriere, Philippe, 3,932,214.

Goloff, Alexander, to Caterpillar Tractor Co. Seal assembly for rotary mechanisms. 3,931,977, Cl. 277-81.00P.

Gomm, Thiel J.; and Price, Stephen E., to Continental Charter Corporation. Filter-discriminator circuit. 3,932,767, Cl. 307-235.00R.

Goode, Raymond A., to Dunbar Manufacturing Co., Inc. Electrically heated dry cereal grain expander. 3,931,757, Cl. 99-323.110.

Goodrich, John Eric; and Hutchinson, Francis Gowland, to Imperial Chemical Industries Limited. Silicone elastomers. 3,932,555, Cl. 260-825.000.

Goodwin, Edwin C., Jr.; and Benham, George K., to Allis-Chalmers Corporation. Circuit breaker having a single pull-rod operating system with a selective trip-free control. 3,932,719, Cl. 200-148.000.

Goodyear Tire & Rubber Company, The: *See—*
Caillet, Eugene, 3,931,834.
Calderon, Nissim, 3,932,373.
Champlin, Roger A., 3,932,345.
Saracsan, Jeffrey W., 3,932,255.
Touchette, John W., 3,932,256.

Gorton, Bert Sorelle, to Du Pont de Nemours, E. I., and Company. Adhesive composition of vinyl ester polymer, polyvinyl alcohol, glyoxal, and a water miscible alcohol. 3,932,335, Cl. 260-29.6WA.

Gortsema, Frank P., to Union Carbide Corporation. Process for the preparation of fine grain metal carbide powders. 3,932,594, Cl. 423-440.000.

Gotchy, Reginald L., to United States of America, Energy Research and Development Administration. System for disposing of radioactive water. 3,932,300, Cl. 252-301.10W.

Gottesman, Roy T.: *See—*
Ceprini, Mario Q.; and Gottesman, Roy T., 3,932,285.

Gould, Henry, to Tenneco Chemicals, Inc. Process for the production of 2,3-dibromo-1-propanol. 3,932,540, Cl. 260-633.000.

Graf, Carl R.: *See—*
Hahn, William F.; Graf, Carl R.; and Hart, George H., 3,931,937.

Graham, James Richard; Ernest, Michael Vance; and Maselli, James Michael, to W. R. Grace & Co. Auto exhaust catalysts prepared from sulfite treated platinum and palladium salt solutions. 3,932,309, Cl. 252-439.000.

Graham, Roy R., to PPG Industries, Inc. Forming size for textile glass fibers. 3,932,193, Cl. 106-211.000.

Grandine, Joseph D., to Millipore Corporation. Method of sample application to gel electrophoresis media. 3,932,229, Cl. 204-180.00G.

Grant, Marshall D. Net post retention device. 3,931,965, Cl. 273-29.0BF.

Grant, Peter M.: *See*—
McConnell, Richard L.; Taylor, Robert B.; and Grant, Peter M., 3,932,368.

Grantham, LeRoy F.; Gehri, Dennis C.; and Katz, Bruno, to Rockwell International Corporation. Absorption of sulfur oxides from flue gas. 3,932,587, Cl. 423-242.000.

Grasselli, Robert K.; Suresh, Dev. D.; and Callahan, James L., to Standard Oil Company, The. Process for the preparation of diolefins from olefins. 3,932,551, Cl. 260-680.00E.

Grasshoff, J. Michael; and Taylor, Lloyd D., to Polaroid Corporation. Benzylthiosulfuric acid salts. 3,932,480, Cl. 260-453.00R.

Graulus, Marcel J. R.: *See*—
Fader, John H.; Keijzer, Johan H.; Graulus, Marcel J. R.; and Beets, Roland H. C., 3,931,961.

Graumann, Richard E.: *See*—
Shaw, Fred B.; and Graumann, Richard E., 3,932,693.

Graven, Robert Michael. Coloringbook, a solid state display device. 3,932,862, Cl. 340-324.00M.

Graves, Paul W.; and Rhodes, Constantine, to GTE Sylvania Incorporated. High voltage switching generator. 3,932,772, Cl. 307-264.000.

Great Lakes Chemical Corporation: *See*—
Gerns, Fred R., 3,932,542.

Grebert, Robert Omer Emmanuel: *See*—
Doin, Bernard Jean Felix Victor; Grebert, Robert Omer Emmanuel; and Jouhaud, Yves Pierre, 3,931,709.

Green, Joseph; and Morgan, Brian, to Beecham Group Limited. Biologically active substance. 3,932,659, Cl. 424-325.000.

Greensides, Christopher John, to Clarks Limited. Foot measuring machines. 3,931,680, Cl. 33-3.00B.

Greer, Phillip E.: *See*—
Sklena, Martin L.; Balent, Russell P.; and Greer, Phillip E., 3,931,892.

Gregory, Gordon Ian: *See*—
Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, 3,932,385.

Greten, Berndt: *See*—
Brinkman, Heinz; Gersbeck, Rolf; and Greten, Berndt, 3,932,258.

Griffiths, Clifford H.; and Walker, Michael S., to Xerox Corporation. Direct alpha to X phase conversion of metal-free phthalocyanine. 3,932,180, Cl. 96-1.500.

Grimaldi, Rinaldo: *See*—
Di Stefano, Vittorio; Grimaldi, Rinaldo; and Marini, Paolo, 3,932,135.

Grimaldo, Samuel. Collapsible trailer hoist. 3,931,895, Cl. 214-1.00A.

Grimston, Roger Anthony, to Burmah Engineering Company Limited. Mechanical seals. 3,931,978, Cl. 277-93.000.

Gritz, Darrell D., to Jacuzzi Bros. Incorporated. Pump systems for liquids. 3,931,830, Cl. 137-505.450.

Grohe, Klaus; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. 2-Thiazolone-5-carboxylic acid ester fungicidal agents. 3,932,436, Cl. 260-306.70R.

Groll, Manfred; Hederich, Volker; and Bien, Hans-Samuel, to Bayer Aktiengesellschaft. Quinophthalone dyestuffs. 3,932,419, Cl. 260-289.0QP.

Groover, Robert Guy, to Raymond Lee Organization, Inc., The, a part interest. Automobile headlight switch. 3,932,788, Cl. 315-82.000.

Gross, Rudolf; and Plotz, Johann, to Kraftwerke Union Aktiengesellschaft. Apparatus and method for depressurizing, degassing and affording decay of the radioactivity of weakly radioactive condensates in nuclear power plants. 3,932,212, Cl. 176-37.000.

Grossman, Joseph H.: *See*—
Johnson, David A.; Brundidge, Steven P.; Vulcano, Albert L.; Sapino, Chester, Jr.; Mahan, James; and Grossman, Joseph H., 3,932,392.

Groupement d'Interet Economique Stx: *See*—
D'Albignac, Jean Marie Louis Jules, 3,932,127.

Grubb, Daniel Baker, to AMP Incorporated. Propellant-driven device for crimping large size wire and terminals. 3,931,726, Cl. 72-430.000.

Grychtol, Klaus, to BASF Aktiengesellschaft. Quaternized 6-diethylamino-2-[benzimidazolyl-(2)]benzofuran. 3,932,446, Cl. 260-309.200.

GTE Automatic Electric Laboratories Incorporated: *See*—
Reimer, William A.; and Scheuerman, Elmer L., 3,932,012.

GTE Laboratories, Incorporated: *See*—
Buhrer, Carl F., 3,932,827.
Ramsey, Hubert J.; Stone, Samuel M.; and Zucker, Joseph, 3,932,761.

GTE Sylvania Incorporated: *See*—
Fisher, Mahlon B.; Gallaro, Anthony V.; and Williams, G. Norman, 3,932,183.
Graves, Paul W.; and Rhodes, Constantine, 3,932,772.
Kopelman, Bernard, 3,932,782.

GTI Corporation: *See*—
Sklena, Martin L.; Balent, Russell P.; and Greer, Phillip E., 3,931,892.

Gubernick, Joseph: *See*—
Rosenstreich, Joseph; Gubernick, Joseph; and Garone, Frank, 3,932,609.

Guerrieri, Salvatore A., to University of Delaware, The. Removal of oxides of sulfur from gases. 3,932,586, Cl. 423-242.000.

Guigmard, Jean Hubert, to Schlumberger Technology Corporation. Methods and apparatus for measuring the rate of penetration in well drilling from floating platforms. 3,931,735, Cl. 73-151.500.

Guimier, Jacques A.; and Coutin, Pierre F., to R. Alkan & Cie. Remote electrical transmission system. 3,932,714, Cl. 191-12.00R.

Gulf Research & Development Company: *See*—
Barie, Walter P., Jr., 3,932,343.
Doyle, William C., Jr.; and Hedrich, Loren W., 3,932,437.
Lakshmanan, Pallavoor R., 3,932,329.
Lakshmanan, Pallavoor R., 3,932,330.
Matthews, Joseph S., 3,932,557.
Moore, Joseph E., 3,932,660.

Gutalj, Vladimir: *See*—
Gaigg, Wilhelm; and Gutalj, Vladimir, 3,932,720.

Gutbier, Heinrich; and Hohne, Karl, to Siemens Aktiengesellschaft. Process for the generation of hydrogen. 3,932,600, Cl. 423-657.000.

Guzzetta, Matthew P. Petcock. 3,931,954, Cl. 251-109.000.

H. H. Robertson Company: *See*—
Fork, Frank W.; Lindner, Robert G.; Kelly, Charles J.; and Albrecht, Raymond E., 3,932,696.

Haas, Gerhard J., to General Foods Corporation. Oral preparations for reducing the incidence of dental caries. 3,932,603, Cl. 424-49.000.

Haas, Hans: *See*—
Seither, Karl; Matthias, Guenther; Diem, Hans; Hussy, Oskar; and Haas, Hans, 3,932,522.

Haase, Jan R.; Landholm, Richard A.; and Krutak, James J., Sr., to Eastman Kodak Company. Magenta image-providing phenylazonaphthyl dyes. 3,932,381, Cl. 260-197.000.

Haase, Jan R.: *See*—
Krutak, James J., Sr.; Haase, Jan R.; and Landholm, Richard A., 3,932,380.

Habeck, Dietmar A.; and Houlihan, William J., to Sandoz, Inc. Substituted indeno, naphtho and cyclohepta pyrazoles. 3,932,430, Cl. 260-296.00T.

Haberditz, Wilhelm-Rudiger: *See*—
Staab, Joachim; Apel, Willy; Drager, Achim; Haberditz, Wilhelm-Rudiger; and Fabinksi, Walter, 3,932,041.

Habermeier, Juergen; and Porret, Daniel, to Ciba-Geigy Corporation. Diacrylic acid ester derivatives of bis-hydantoin compounds. 3,932,176, Cl. 260-309.500.

Hack, Heinrich, to Carl Schenck AG, Firma. Method for controlling the weight correction of workpieces prior to finish-machining. 3,932,053, Cl. 408-1.000.

Haddow, Thomas: *See*—
Stratton, John Frederick; Haddow, Thomas; and Gates, Eric, 3,931,932.

Haden, Walter L., Jr.; and Dzierzanowski, Frank J., to Engelhard Minerals & Chemicals Corporation. Hydrocarbon conversion process. 3,932,268, Cl. 208-120.000.

Haefely, Willy, to Hoffmann-La Roche Inc. Antidepressant compositions. 3,932,652, Cl. 424-274.000.

Hahn-Meitner-Institut fur Kernforschung Berlin GmbH: *See*—
Bilal, Abdel-Lativ; Metscher, Klaus; Muhlig, Bernhard; Reichmuth, Christoph; Schwarz, Bernd; and Zimen, Karl-Erik, 3,932,225.

Hahn, William F.; Graf, Carl R.; and Hart, George H., to Pennsylvania Crusher Corporation. Breaker/crusher. 3,931,937, Cl. 241-74.000.

Hajos, Gyorgy: *See*—
Hideg, Kalman; Hankovszky, Olga; Palosi, Eva; Hajos, Gyorgy; and Szporny Laszlo, 3,932,395.

Halcon International, Inc.: *See*—
Russell, Joseph L., 3,932,513.

Halcour, Kurt: *See*—
Thelen, Hermann; Halcour, Kurt; Schwerdtel, Wulf; and Swodenk, Wolfgang, 3,932,514.

Halik, Linda K.: *See*—
Friedman, Herman H.; Halik, Linda K.; and Schwarz, Milton H., 3,932,622.

Hall, Allen S., Jr.: *See*—
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Hall-Thermotank Products Ltd.: *See*—
Haselden, Geoffrey Gordon, 3,931,718.

Hamachi, Kazuo: *See*—
Irie, Toshio; Yokoyama, Yasuo; Kameishi, Yoshihiko; Yamaguchi, Katsuo; and Hamachi, Kazuo, 3,932,237.

Hamada, Yoshinori: *See*—
Sawa, Yoshiro; Hirose, Katsumi; Maeda, Shin; and Hamada, Yoshinori, 3,932,384.

Hamaguchi, Hachiro; and Takahama, Hiroshi, to Tatsuta Densen Kabushiki Kaisha. Pre-treatment method for electroless plating for producing a metal film as resistor. 3,932,694, Cl. 428-432.000.

Hamilton, Martin W., to Eaton Corporation. Crane radius instrument. 3,932,855, Cl. 340-267.00C.

Hammann, Ingeborg: *See*—
Buttner, Gerhard; Sasse, Klaus; Hammann, Ingeborg; and Kaspers, Helmut, 3,932,406.

Hammons, Burton F.: *See*—
Bolton, Theodore S.; and Hammons, Burton F., 3,932,157.

Hanchett, Leland J., to Taplin Business Machines Incorporated. Error detection and sequence maintaining system for bar-code readers. 3,932,840, Cl. 340-146.30Z.

Hankovszky, Olga: *See*—
Hideg, Kalman; Hankovszky, Olga; Palosi, Eva; Hajos, Gyorgy; and Szporny, Laszlo, 3,932,395.

Hansen, Dan S., to F. L. Smidth & Co. Method and apparatus for burning pulverulent materials. 3,932,116, Cl. 432-14.000.

Hansen, Kenneth N., to Allis-Chalmers Corporation. Cable actuated clutch control. 3,931,746, Cl. 74-501.00R.

Hanson, Harold Duane: *See*—
Rayl, Martin; and Hanson, Harold Duane, 3,932,851.

Hanson, Raymond C., to Hewlett-Packard Company. Circuit to reduce harmonic distortion in a triangular wave-form function generator. 3,932,741, Cl. 235-197.000.

Hanz, Marvin C.: *See*—
Elkins, Johnny C.; and Hanz, Marvin C., 3,931,893.

Hara, Akio; and Yazu, Shuji, to Sumitomo Electric Industries, Ltd. Method of making surface-coated cemented carbide articles. 3,932,231, Cl. 204-181.000.

Hara, Yoichi: *See*—
Hibino, Toshihiko; Suzuki, Yoshio; Okano, Shigeru; Hara, Yoichi; and Sato, Etsuro, 3,932,400.

Harada, Jumei; Tsukamoto, Kenji; Migita, Tetsuhiko; and Matsunaga, Tsutomu, to Bridgestone Tire Company Limited. Flexible annular core used for the production of hollow toroidal rubber shells. 3,932,088, Cl. 425-242.000.

Harada, Tetsuya: *See*—
Horie, Masakazu; Fukuhara, Takao; and Harada, Tetsuya, 3,931,813.

Harbar, John Richard: *See*—
Evans, Leslie Samuel; and Harbar, John Richard, 3,932,195.

Hardy, Leon: *See*—
Lekarski, Simeon; Hardy, Pierre; and Hardy, Leon, 3,932,001.

Hardy, Pierre: *See*—
Lekarski, Simeon; Hardy, Pierre; and Hardy, Leon, 3,932,001.

Harner, Kermit I.; and Schneider, Roy W., to United Technologies Corporation. Control system for variable pitch fan propulsor. 3,932,058, Cl. 416-28.000.

Harrell, John W.; and Allen, Wallace B., to Mobil Oil Corporation. DC/AC motor drive for a downhole acoustic transmitter in a logging-while-drilling system. 3,932,836, Cl. 340-18.0LD.

Harris, Berlin C., Jr.: *See*—
Kucsma, Michael E.; Babcock, Gary J.; and Harris, Berlin C., Jr., 3,932,573.

Harris, William B.; and Davison, Richard R., to Morse, William D., Jr., a part interest. Liquid aquifer energy storage method. 3,931,851, Cl. 165-2.000.

Harshaw Chemical Company, The: *See*—
Stotlar, Suzanne C., 3,932,753.

Hart, George H.: *See*—
Hahn, William F.; Graf, Carl R.; and Hart, George H., 3,931,937.

Hartel, Gunter, to Deutsche Vergaser GmbH & Co. Kommanditgesellschaft. Method and installation for the predetermined addition of secondary air for the optimum combustion of exhaust gases of internal combustion engines. 3,931,710, Cl. 60-276.000.

Harting, Jurgen: *See*—
Kramer, Josef; Radunz, Hans; Orth, Dieter; Baumgarth, Manfred; and Harting, Jurgen, 3,932,487.

Hartman, Richard L., to United States of America, Army. Far field construction for optical fourier transforms. 3,932,745, Cl. 250-216.000.

Hartmann & Braun Aktiengesellschaft: *See*—
Staab, Joachim; Apel, Willy; Drager, Achim; Haberditz, Wilhelm-Rudiger; and Fabinksi, Walter, 3,932,041.

Hartsell, Glenn A.: *See*—
Brixey, Charles W.; Hartsell, Glenn A.; and Vandierendonck, Jerry L., 3,932,846.

Haruki, Tatsuro; and Akiyama, Junichi, to Shimadzu Seisakusho Ltd. Electrophoretic measurement system including means for determining zone boundries. 3,932,264, Cl. 204-299.000.

Harvey, Bobbie S. Projectile having indented surface areas. 3,931,971, Cl. 273-106.00R.

Harvey Hubbell, Incorporated: *See*—
Muchnick, Paul, 3,932,790.

Hasegawa, Hiroshi; and Sato, Toru, to Nippon Kogaku K.K. Illuminating device in an ophthalmometer. 3,932,030, Cl. 351-6.000.

Hasegawa, Katsumi; Kumo, Ichiro; Yamazaki, Chikayasu; Okabayashi, Minoru; Nakayama, Takao; and Oshiyama, Masahiro, to Toray Industries, Inc. Method and apparatus for winding yarn into yarn package. 3,931,938, Cl. 242-45.000.

Haselden, Geoffrey Gordon, to Hall-Thermotank Products Ltd. Refrigerant screw compression with liquid refrigerant injection. 3,931,718, Cl. 62-505.000.

Hash, Robert S.: *See*—
Korff, Wolfram G.; Emery, Vernon V.; Bond, Joseph Kim; and Hash, Robert S., 3,932,094.

Hatridge, Frank J. Pump. 3,931,755, Cl. 92-155.000.

Hauber, Charles Elwood; Vizvary, Stephen L.; Simpson, Robert E.; and Meyer, Jerome W., to Singer Company, The. Transition monitor for a unit transition counter. 3,932,738, Cl. 235-153.0AP.

Hauser, Raimund: *See*—
Freudenschuss, Otto; Krammer, Herbert; and Scheiber, Robert, 3,932,742.
Hellinger, Otto, 3,931,920.

Hawker Siddeley Dynamics Limited: *See*—
Parsons, Brian Jeremy, 3,932,734.

Hawkins, James Maynard: *See*—
Caldwell, John R.; and Hawkins, James Maynard, 3,932,311.

Hawkins, Wallace H. Hoist. 3,931,956, Cl. 254-8.00B.

Hay, John Henry: *See*—
Jury, Harold Rex; and Hay, John Henry, 3,932,249.

Hayashi, Goro: *See*—
Takeda, Mikio; Inoue, Hirozumi; Hayashi, Goro; and Nurimoto, Seiichi, 3,932,429.

Hayashi, Torahiko. Automatic device for final proofing. 3,931,759, Cl. 99-468.000.

Hayashibara Biochemical Laboratories, Inc.: *See*—
Nakashio, Seizo; Sekine, Noriyuki; Toyota, Nobuhiro; Fujita, Fumio; and Domoto, Masahiro, 3,932,192.

Hayes, Thomas Edward, to Johnson Service Company. Method and apparatus for storing a medium heated by solar energy. 3,931,806, Cl. 126-400.000.

Hazeltine Corporation: *See*—
Masak, Raymond J., 3,932,818.

Hedberg, John K. Adjustable tennis racket handle. 3,931,968, Cl. 273-75.000.

Hederich, Volker: *See*—
Groll, Manfred; Hederich, Volker; and Bien, Hans-Samuel, 3,932,419.

Hedrich, Loren W.: *See*—
Doyle, William C., Jr.; and Hedrich, Loren W., 3,932,437.

Heinemann, Hans: *See*—
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Heinzelmann, Walter: *See*—
Bison, Gunter; Heinzelmann, Walter; Linkat, Norbert; and Wolfes, Wolfgang, 3,932,441.

Hellinger, Otto, to Vockenhuber, Karl; and Hauser, Raimund. Strip-guiding structure for recording or reproducing apparatus. 3,931,920, Cl. 226-91.000.

Hellsten, Karl Martin Edvin: *See*—
Martinsson, Eva Margareta; and Hellsten, Karl Martin Edvin, 3,932,495.

Hemming, Harold George: *See*—
Broadbent, Douglas; Hemming, Harold George; and Hesp, Barrie, 3,932,394.

Hendrix, Warren P.: *See*—
Ball, Dean M.; Camp, Ronnie W.; Hendrix, Warren P.; and Orr, Clyde, Jr., 3,932,067.

Hengstebeck, Robert J., to Standard Oil Company. Centrifuge. 3,931,927, Cl. 233-19.00R.

Henkel & Cie G.m.b.H.: *See*—
Lauermann, Georg; and Trabitzsch, Uwe, 3,932,684.

Henle, George A. Combination water supply and waste holding tank. 3,931,907, Cl. 220-22.000.

Henn, Erwin: *See*—
Lucht, Alfred; and Henn, Erwin, 3,932,199.

Henning, Wolfram; and Gettwart, Michael, to Rank Organisation Limited, The. Light guide arrangement with scanning tip to resist uneven wear. 3,932,022, Cl. 350-96.00R.

Henry, Ronald: *See*—
Braun, John D.; Nielsen, Arnold; Pickett, M. Frank; Henry, Ronald; and Norris, William P., 3,932,240.

Henschen, Homer Ernst: *See*—
Yeager, Marvin Leo; and Henschen, Homer Ernst, 3,932,013.

Her Majesty the Queen in right of Ontario, as represented by the Minister of Natural Resources: *See*—
Bradley, Edmund G., 3,931,774.

Herbst, Fritz: *See*—
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Hercules Incorporated: *See*—
Douglas, Paul S.; Patellis, Anargiros Pete; and Vredenburgh, Walter A., 3,932,332.

Hermann Berstorff Maschinenbau GmbH: *See*—
Brinkman, Heinz; Gersbeck, Rolf; and Greten, Berndt, 3,932,258.

Hermanson, William A. Insect exterminator pad. 3,931,692, Cl. 43-131.000.

Hersberger, Pierre: *See*—
Scherrer, Igor; Chetelat, Fernand; and Hersberger, Pierre, 3,931,703.

Hesp, Barrie: *See*—
Broadbent, Douglas; Hemming, Harold George; and Hesp, Barrie, 3,932,394.

Hess, Hans-Jurgen E.: *See*—
Johnson, Michael R.; Schaaf, Thomas K.; Bindra, Jasjit S.; Hess, Hans-Jurgen E.; and Eggler, James F., 3,932,389.

Hesselgren, Sven-Gunnar. Antimicrobial composition. 3,932,607, Cl. 424-52.000.

Heusch, Severin: *See*—
Jabs, Hartmut; and Wiemers, Minny, 3,931,750.

Hewlett-Packard Company: *See*—
Berger, Josef, 3,932,882.
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Hibino, Toshihiko; Suzuki, Yoshio; Okano, Shigeru; Hara, Yoichi; and Sato, Etsuro, to Sumitomo Chemical Company, Limited. Thiazole derivatives. 3,932,400, Cl. 260-247.10M.

Hideg, Kalman; Hankovszky, Olga; Palosi, Eva; Hajos, Gyorgy; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. Tricyclic imidazole derivatives. 3,932,395, Cl. 260-243.00R.

Higashi, Fukuji: *See*—
Yamazaki, Noboru; and Higashi, Fukuji, 3,932,364.

Hijikata, Kazuo, to Olympus Optical Co., Ltd. System for detecting the particular chemical constituent of a fluid. 3,932,132, Cl. 23-253.00R.

Hildebrand, Dietrich: *See*—
Thoma, Wilhelm; Hildebrand, Dietrich; Last, Wolf-Dieter; and Rinke, Heinrich, 3,932,366.

Hildebrandt, Ullrich, to Linde Aktiengesellschaft. System for cooling an object with coolant cycle. 3,932,158, Cl. 62-500.000.

Hill, Ruth Linda: *See—*
Borror, Alan L.; Hill, Ruth Linda; and Zuckerman, Bernard, 3,932,186.

Hill, William Frank, to Lucas Electrical Company Limited. Liquid level detection systems. 3,932,852, Cl. 340-244.00R.

Hillberry, Benny M.; and Hall, Allen S., Jr., to Purdue Research Foundation. Rolling contact joint. 3,932,045, Cl. 403-121.000.

Hiraga, Ryozo: *See—*
Kakei, Mitsuo; Nishida, Keijiro; Kasahara, Tadayoshi; Shimabayashi, Masao; Hiraga, Ryozo; Nakano, Tomomasa; and Komatsubara, Ichiro, 3,931,789.

Hirakawa, Michio: *See—*
Yamaguchi, Tadashi; Ono, Takayuki; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, 3,932,350.

Hirama, Akira: *See—*
Miyano, Katao; Tomizuka, Shunichi; Adachi, Takao; Takenouchi, Tomoo; Kondo, Satoshi; Hirama, Akira; and Endo, Yasuo, 3,932,200.

Hirano, Masachika: *See—*
Okuno, Yoshitoshi; Hirano, Masachika; Ohno, Isao; Takeda, Hisami; Magara, Osamu; Itaya, Nobushige; Nishioka, Toshio; Mizutani, Toshio; Ohno, Nobuo; and Matsuo, Takashi, 3,932,459.

Hirashita, Isao: *See—*
Asakusa, Tokuzo; Honma, Taketoshi; Hirashita, Isao; Yasui, Koichi; Nishi, Yoshio; and Murayama, Koichi, 3,932,584.

Hirata, Sadao; Hirata, Syunsaku; Suzuki, Toru; and Kishimoto, Akira, to Toyo Seikan Kaisha Limited. Resinious laminates having improved gas permeation and delamination resistance. 3,932,692, Cl. 428-474.000.

Hirata, Syunsaku: *See—*
Hirata, Sadao; Hirata, Syunsaku; Suzuki, Toru; and Kishimoto, Akira, 3,932,692.

Hirato, Motohide. Pipe clasper. 3,932,049, Cl. 403-397.000.

Hirose, Katsumi: *See—*
Sawa, Yoshiro; Hirose, Katsumi; Maeda, Shin; and Hamada, Yoshinori, 3,932,384.

Hirota, Kunio; Takata, Yoshinori; Arikawa, Yoshijiro; Tanno, Kazuo; and Okajima, Yoshiaki, to Keishin Matsumoto Director-General of the Agency of Industrial Science and Technology. Method of preventing scale from being deposited in case of producing fresh water from sea water. 3,932,224, Cl. 203-7.000.

Hirwe, Asha: *See—*
Metcalf, Robert L.; and Hirwe, Asha, 3,932,527.

Hitachi Electronics, Ltd.: *See—*
Yanagimachi, Akio; Yamada, Osamu; Yamane, Hisakichi; Sawabe, Eiichi; Uehara, Takashi; Yoshino, Takehiko; Takezawa, Teruhiro; Masuda, Michio; Nabeyama, Hiroaki; Fukuda, Masaaki; and Kayano, Tatsuo, 3,932,698.

Hitachi, Ltd.: *See—*
Kawabe, Ushio; Yamamoto, Shigehiko; Aita, Toshiyuki; and Honda, Yukio, 3,932,314.
Sugita, Yutaka; Kobayashi, Tsutomu; Nishida, Hideki; and Takahashi, Masatake, 3,932,688.
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Hobart Corporation: *See—*
Tiby, Gerard A., 3,931,900.

Hobbs, Howard Frederick, to Variable Kinetic Drives, Ltd. Load moving apparatus. 3,931,958, Cl. 254-150.00R.

Hodler, Karl; and Walter, Erich. Timing device for pneumatic control systems. 3,931,832, Cl. 137-624.110.

Hodogaya Kagaku Kogyo Kabushiki Kaisha: *See—*
Kawakami, Kazuo; Imagome, Hiroshi; Ishizaki, Sumio; and Sugiyama, Genpei, 3,932,121.

Hoechst Aktiengesellschaft: *See—*
Arpe, Hans-Jurgen, 3,932,518.
Muller, Werner H., 3,932,510.
Weber, Helmut; Aumuller, Walter; Muth, Karl; and Weyer, Rudi, 3,932,503.
Weber, Helmut; Aumuller, Walter; Muth, Karl; and Weyer, Rudi, 3,932,658.

Hoefer Scientific Instruments: *See—*
Hoefer, Stanton A., 3,932,265.

Hoefer, Stanton A., to Hoefer Scientific Instruments. Vertical gel slab electrophoresis apparatus. 3,932,265, Cl. 204-299.000.

Hoefke, Wolfgang: *See—*
Losel, Walter; Merz, Herbert; Hoefke, Wolfgang; and Traunecker, Werner, 3,932,626.

Hoehn, Marvin M.: *See—*
Michel, Karl H.; and Hoehn, Marvin M., 3,932,219.

Hoerner Waldorf Corporation: *See—*
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Roccaforte, Harry I., 3,931,889.

Hof, Craig R.: *See—*
Fang, Shou-Mean; and Hof, Craig R., 3,932,134.

Hoff, Don G.; and Young, Patrick, to General Teletronics Incorporated. Electronic business telephone. 3,932,709, Cl. 179-90.00K.

Hoffman, Herbert F. Hydraulic cow catch-carrier. 3,931,796, Cl. 119-151.000.

Hoffman, Karl H.: *See—*
Hunter, Wood Eugene; and Hoffman, Karl H., 3,932,506.

Hoffmann, Hans-Dieter: *See—*
Adolphi, Heinrich; Hoffmann, Hans-Dieter; Koenig, Karl-Heinz; and Rohr, Wolfgang, 3,932,632.

Hoffmann-La Roche Inc.: *See—*
Coffen, David Llewellyn; and Fryer, Rodney I., 3,932,399.
Cohen, Noal; and Saucy, Gabriel, 3,932,519.
Haefely, Willy, 3,932,652.
Surmatis, Joseph Donald, 3,932,485.

Hoffmann, Werner, to BASF Aktiengesellschaft. 2-Methyl-2-hepten-6-on-1-al acetals. 3,932,520, Cl. 260-594.000.

Hoh, George Lok Kwong; and Reardon, Joseph Edward, to Du Pont de Nemours, E. I., and Company. Soft thermoplastic segmented copolyesters as pressure sensitive adhesives. 3,932,326, Cl. 260-26.000.

Hohenschutz, Heinz: *See—*
Strohmeyer, Max; Walz, Helmut; Appl, Max; Moell, Hans; Kerber, Horst; and Hohenschutz, Heinz, 3,932,523.

Hohne, Karl: *See—*
Gutbier, Heinrich; and Hohne, Karl, 3,932,600.

Hoke, Donald Irvin, to Lubrizol Corporation, The. Aminosulfonic acid-heterocyclo propane-amine reaction products and fuels and lubricants containing same. 3,932,288, Cl. 252-33.000.

Holdsworth, Robert S.; O'Neill, Gerald J.; and Tarrant, Paul, to W. R. Grace & Co. 1-Chloro-2,2-dimethyl-1,4,4-trifluorocyclobutane as an anesthetics. 3,932,669, Cl. 424-352.000.

Holdsworth, Robert S.: *See—*
Billings, Charles A.; O'Neill, Gerald J.; Simons, Charles W.; and Holdsworth, Robert S., 3,932,529.

Holland, Gerald F., to Pfizer Inc. Cyclic N-substituted derivatives of 1,4-benzene disulphonamide. 3,932,640, Cl. 424-248.000.

Holland, Gerald F., to Pfizer Inc. Cyclic N-substituted derivatives of 1,4-benzene disulphonamide. 3,932,647, Cl. 424-267.000.

Holland, Gerald F., to Pfizer Inc. Cyclic N-substituted derivatives of 1,4-benzene disulphonamide. 3,932,648, Cl. 424-267.000.

Holliday, Robert G. Trailer with moveable axle assembly. 3,931,987, Cl. 280-80.00B.

Hollingshad, William Robert, to Calgon Corporation. Corrosion inhibition with triethanolamine phosphate ester compositions. 3,932,303, Cl. 252-389.00A.

Holman, Merle A. Method of and apparatus for cutting vehicle tires. 3,931,935, Cl. 241-24.000.

Holmes, Frank A.; and Stansbury, Benjamin H., Jr., to Jaybee Manufacturing Corporation. Springless self-latching hinge having a resilient hinge member. 3,931,663, Cl. 16-142.000.

Holtkamp, Calvin J., to White-Westinghouse Corporation. Push-to-turn thermal cycling switch. 3,932,830, Cl. 337-64.000.

Hombach, Carl J. Holder for a kitchen utensil. 3,931,668, Cl. 24-261.00A.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Tamai, Hisashi; and Nakano, Soichi, 3,931,799.

Honda, Jack S.: *See—*
Yuan, Lloyd T.; and Honda, Jack S., 3,932,815.

Honda, Yukio: *See—*
Kawabe, Ushio; Yamamoto, Shigehiko; Aita, Toshiyuki; and Honda, Yukio, 3,932,314.

Honeywell Information Systems, Inc.: *See—*
MacGregor, William W., 3,932,816.

Honjo, Satoru: *See—*
Kaneda, Takuji; Nagao, Makoto; Honjo, Satoru; and Mizuki, Eiichi, 3,932,189.

Honma, Taketoshi: *See—*
Asakusa, Tokuzo; Honma, Taketoshi; Hirashita, Isao; Yasui, Koichi; Nishi, Yoshio; and Murayama, Koichi, 3,932,584.

Hood, Henry Alexander, to Wall Industries, Inc. Rope terminations and methods and apparatus for fabricating the same. 3,932,697, Cl. 174-79.000.

Hoogeboom, Adrianus Johannes Theodorus, to Landi Den Hartog B.V. Control device. 3,931,798, Cl. 123-120.000.

Horbach, Stephen. Mold base. 3,932,085, Cl. 425-186.000.

Horie, Akira: *See—*
Okagami, Akio; Horie, Akira; and Toida, Tsutomu, 3,932,147.

Horie, Masakazu; Fukuhara, Takao; and Harada, Tetsuya, to Nisaan Motor Company Limited. Exhaust gas recirculation control device. 3,931,813, Cl. 123-119.00A.

Hornbaker, Edwin D.; and Sparks, Bryan, to Ethyl Corporation. Emulsion polymerization of vinyl bromide with vinyl comonomer. 3,932,336, Cl. 260-29.60R.

Hornbuckle, Hal E., to Belmont Textile Machinery Co., Inc. Pneumatically operated swift for holding skeins of yarn to be unwound vertically. 3,931,941, Cl. 242-110.000.

Horsting, Albertus G.; and Luzaich, Samuel, to Tur-Colossus, Inc. Apparatus for cleaning and disinfecting insemination straws. 3,931,661, Cl. 15-308.000.

Horton, Donald R.: *See—*
Brannon, Donald R.; and Horton, Donald R., 3,932,619.

Horvath, Arisztid Lajos: *See—*
Clementson, John Joseph; and Horvath, Arisztid Lajos, 3,932,297.

Horvath, Emory. Magnetic tape player with cartridge door opening means. 3,932,891, Cl. 360-93.000.

Hosaka, Hideo; and Kawamata, Yasuo, to Max Kabushiki Kaisha. Powder ejector. 3,931,914, Cl. 222-193.000.

Hosaka, Hirokazu: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,932,528.

Hoshi, Hiroshi: *See—*
Yamaguchi, Tadashi; Ono, Takayuki; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, 3,932,350.

Hotta, Kozo: *See—*
Fukushima, Nobuo; Inoue, Masakazu; Takai, Ryouzo; and Hotta, Kozo, 3,931,762.

Hotta, Masao: *See—*
Abe, Zenuemon; Tanaka, Kunio; Hotta, Masao; and Imai, Masaaki, 3,932,805.

Houlihan, William J., to Sandoz, Inc. Intermediates in the preparation of imidazo(2,1-alpha)isoindoles. 3,932,450, Cl. 260-309.600.

Houlihan, William J.: *See—*
Habeck, Dietmar A.; and Houlihan, William J., 3,932,430.

Hounsfield, Godfrey Newbold, to EMI Limited. Apparatus for producing a visual representation of a radiographic scan. 3,932,757, Cl. 250-365.000.

Houssin, Jean Marie Alfred: *See—*
Domergue, Annick Marthe Suzanne Simone; Sureau, Robert Frederic Michel; Leboulenger, Jean Ernest Etienne; and Houssin, Jean Marie Alfred, 3,932,413.

Hovland, Per Jorgen: *See—*
Connolly, David Charles Anthony; and Hovland, Per Jorgen, 3,932,707.

Howard Machinery Limited: *See—*
North, Bernard C., 3,931,858.

Howard, Robert C.: *See—*
Dunlay, John B.; and Howard, Robert C., 3,932,776.

Howe, Fred Ellsworth, to Cominco Ltd. Barrel shaped mercury separator with spoked agitator. 3,932,284, Cl. 210-523.000.

Hsiung, Du Yung, to Gillette Company, The. Two-part hair dye or hair bleach package. 3,931,912, Cl. 222-94.000.

Huber, William W.; Shriner, Rollin R.; and Shuman, Harry N., to Spartek Inc. Case assembly with tungsten carbide inserts for ceramic tile die. 3,932,098, Cl. 425-412.000.

Hudson, Monie S., to United States of America, Health, Education and Welfare. Extracts from active tree saps. 3,932,628, Cl. 424-195.000.

Hughes Aircraft Company: *See—*
Pastor, Ricardo C., 3,932,597.

Hull, Charles Hartley: *See—*
Ashfield, Herbert Edward; and Hull, Charles Hartley, 3,931,812.

Humer, Donald D., to Du Pont de Nemours, E. I., and Company. Optical coupler for transmitting light linearly between a single point and plural points. 3,932,023, Cl. 350-96.00C.

Hunter, Robert H.; and Zech, John David, deceased, to ICI United States Inc. Ethers of polyglycerol. 3,932,532, Cl. 260-615.00R.

Hunter, Wood Eugene; and Hoffman, Karl H., to Nalco Chemical Company. Raney copper catalyst production and use. 3,932,506, Cl. 260-561.00N.

Hunziker, Louis A. Removable jacking wheel unit. 3,931,986, Cl. 280-43.200.

Hureau, Jean-Claude; Rota, Benjamin; and Thomas-Castelnau, Philippe, to Generale Alimentaire. Apparatus for making plastics mesh structures and other forms of openwork. 3,932,092, Cl. 425-382.000.

Hussy, Oskar: *See—*
Seither, Karl; Matthias, Guenther; Diem, Hans; Hussy, Oskar; and Haas, Hans, 3,932,522.

Hutchinson, Francis Gowland: *See—*
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Hydrocarbon Research, Inc.: *See—*
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HydroTech International, Inc.: *See—*
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ICI United States Inc.: *See—*
Hunter, Robert H.; and Zech, John David, deceased, 3,932,532.

Ikeda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Original holder plate for copying machine. 3,932,037, Cl. 355-76.000.

ILC-Steinthal, Inc.: *See—*
Sepp, Oscar W., 3,931,945.

Illingworth, Robert H.; and Lorey, Frank W., to Garden State Paper Co., Inc. Process for de-inking printed waste cellulosic fibrous material. 3,932,206, Cl. 162-5.000.

Illinois Tool Works Inc.: *See—*
Soltysik, Edmund John, 3,931,946.

Imada, Seiya: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,932,528.

Imagome, Hiroshi: *See—*
Kawakami, Kazuo; Imagome, Hiroshi; Ishizaki, Sumio; and Sugiyama, Genpei, 3,932,121.

Imai, Masaaki: *See—*
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Imanaka, Takuichi; Kan, Takahiro; Obata, Yoshio; and Sato, Toru, to Kawasaki Steel Corporation. Method for manufacturing single-oriented electrical steel sheets comprising antimony and having a high magnetic induction. 3,932,234, Cl. 148-112.000.

IMI (TAMI) Institute for Research & Development: *See—*
Rona, Peter, 3,932,306.

Imperial Chemical Ind. (Europa) Fibres: *See—*
Wetzel, Wolfgang; and Muller, Manfred, 3,932,854.

Imperial Chemical Industries Limited: *See—*
Ashton, Stanley; Sharma, Vijay Ratna; and Taylor, John Anthony, 3,932,403.
Broadbent, Douglas; Hemming, Harold George; and Heap, Barrie, 3,932,394.
Clementson, John Joseph; and Horvath, Arisztid Lajos, 3,932,297.
Cotterrell, Graham Paul, 3,932,631.
Cox, David Lloyd; and McDonnell, Neil Patrick Hugh, 3,932,570.
Goodrich, John Eric; and Hutchinson, Francis Gowland, 3,932,555.

Inaba, Shigeho: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Akatsu, Mitsuhiro; Baile, Clifton A.; and Parish, Roger G., 3,932,637.

Inamoto, Yoshiaki; and Aigami, Koji, to Kao Soap Co., Ltd. Process for preparing new amidine compounds. 3,932,492, Cl. 260-501.140.

Information Terminals Corporation: *See—*
Ward, Paul F., 3,932,895.

Infranca, Leonard. Pediatric corrective device. 3,931,817, Cl. 128-80.00A.

Infrared Industries, Inc.: *See—*
Riedl, Max J.; and Ross, Thaddeus C., 3,932,754.

Inglis Nurseries Inc.: *See—*
Fink, Robert, 3,932,052.

Ingram, Woodrow Hayes, II, to Monsanto Company. Emulsified phenolic resin system containing an anti-migratory additive. 3,932,333, Cl. 260-29.300.

Ingrip Fasteners, Inc.: *See—*
Brumlik, George C., 3,932,090.

Inland Steel Company: *See—*
Robins, Norman A.; and Bugajski, Frank H., 3,932,683.

Inmont Corporation: *See—*
Zamer, Joseph, 3,932,561.

Inn-Tronics: *See—*
Smith, James O.; and Gade, John J., 3,932,858.

Inoue, Hirozumi: *See—*
Takeda, Mikio; Inoue, Hirozumi; Hayashi, Goro; and Nurimoto, Seiichi, 3,932,429.

Inoue, Kiyoshi. Powder activation in an inert atmosphere. 3,932,760, Cl. 250-492.000.

Inoue, Masakazu: *See—*
Fukushima, Nobuo; Inoue, Masakazu; Takai, Ryouzo; and Hotta, Kozo, 3,931,762.

Instytut Przemyslu Miesnego: *See—*
Janicki, Mieczyslaw; Muler, Henryk; and Nijaki, Wladyslaw, 3,932,676.

Intel Corporation: *See—*
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Interatom Internationale Atomreaktorbau GmbH: *See—*
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Interform, Inc.: *See—*
Dashew, Stephen S., 3,931,952.

International Business Machines Corporation: *See—*
Arter, Nelson K.; Eichhorn, Thomas F.; and Kalthoff, Clement H., 3,932,894.
Ayer, Thad E., 3,931,880.
Smith, Ronald Morton, 3,932,847.
Sprokel, Gerard J., 3,932,026.

International Pharmakon Laboratories, Inc.: *See—*
Conn, Richard H., 3,932,655.

International Standard Electric Corporation: *See—*
Trelut, Jean Marie; Liot, Jean Bernard Michel; Cagnac, Therese Marie Leonie; and Chambet-Falquet, Antoine Jean Louis, 3,932,843.

International Tapetronics Corporation: *See—*
Jenkins, John P., 3,932,887.

International Telephone and Telegraph Corporation: *See—*
Sears, Karl David, 3,932,488.

Investors in Ventures, Inc.: *See—*
Bucalo, Louis, 3,931,820.

Irie, Toshio; Yokoyama, Yasuo; Kameishi, Yoshihiko; Yamaguchi, Katsuo; and Hamachi, Kazuo, to Kawasaki Steel Corporation. Method for forming an insulating glass film on surfaces of an oriented silicon steel sheet. 3,932,237, Cl. 148-113.000.

Isaac, Otto; and Offermanns, Heribert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the recovery of pure alpha-bisabolol. 3,932,533, Cl. 260-617.00R.

Ishikawa, Hiroshi, to Olympus Optical Co., Ltd. System for detecting the particular chemical component of a test fluid. 3,932,133, Cl. 23-253.00R.

Ishizaki, Sumio: *See—*
Kawakami, Kazuo; Imagome, Hiroshi; Ishizaki, Sumio; and Sugiyama, Genpei, 3,932,121.

Ismail, Roshdy: *See—*
Zoche, Gunter; Richtzenhain, Hermann; and Ismail, Roshdy, 3,932,535.

Isoda, Narihiro, to Suntex Limited. Apparatus for liquid treatment of a cloth band of an endless form. 3,931,722, Cl. 68-176.000.

Itaya, Nobushige: *See—*
Okuno, Yoshitoshi; Hirano, Masachika; Ohno, Isao; Takeda, Hisami; Magara, Osamu; Itaya, Nobushige; Nishioka, Toshio; Mizutani, Toshio; Ohno, Nobuo; and Matsuo, Takashi, 3,932,459.

Ito, Ryosuke: *See—*
Takahashi, Susumu; and Ito, Ryosuke, 3,932,706.

Ito, Shojiro; Takami, Akira; and Takekoshi, Tokio, to Meiji Seika Co., Ltd. Process for the preparation of granules. 3,932,615, Cl. 424-80.000.

Itoh, Hirataka: *See*—
Fukumi, Hirokazu; Itoh, Koryo; Usubuchi, Yutaka; and Itoh, Hirataka, 3,932,497.

Itoh, Koryo: *See*—
Fukumi, Hirokazu; Itoh, Koryo; Usubuchi, Yutaka; and Itoh, Hirataka, 3,932,497.

Ivakhnenko, Viktor Vasilievich; Kuznetsov, Evgeny Fedorovich; Sudarev, Anatoly Vladimirovich; Akodes, Jury Grigorievich, deceased; and by Akodes, Zoya Ivanovna, administrator. Plate-type heat-exchange apparatus. 3,931,854, Cl. 165-166.000.

Iwaasa, Takashi: *See*—
Yokotsuka, Tamotsu; Iwaasa, Takashi; Okami, Tadao; Noda, Minoru; and Fujii, Mitsuharu, 3,932,671.

Iwaki, Koichi; Wakabayashi, Atsushi; Nagahori, Yukihiro; and Nakagawa, Shiro, to Jeco Kabushiki Kaisha. Counter feed mechanism as used in digital clock. 3,931,705, Cl. 58-125.00C.

Iwako, Hiroyuki, to Funken Co., Ltd. Revolution speed controller using both analog and digital control. 3,932,794, Cl. 318-318.000.

Iwamoto, Hideo; and Miyamoto, Mamoru, to Mitsubishi Denki Kabushiki Kaisha. Direct current power control circuit. 3,932,800, Cl. 321-43.000.

Iwata, Sigetaka: *See*—
Shiraishi, Makoto; Iwata, Sigetaka; and Oura, Masao, 3,932,574.

Izumi, Gaku; Kimura, Tetsuo; Mori, Katsuyoshi; and Koizumi, Michiko, to Director-General of the Agency of Industrial Science and Technology. Method for eliminating metals from a solution containing a very slight amount of the metals. 3,932,274, Cl. 210-44.000.

Izumi, Kenkichi: *See*—
Komai, Mitsumasa; Sawa, Toshio; and Izumi, Kenkichi, 3,932,150.

J. I. Case Company: *See*—
Schuck, Paul R., 3,931,717.

J. J. Baker Company Limited: *See*—
Turnbull, James O'Hara; Merritt, William Lipscomb; and McLaughlin, Ivan Patrick, 3,931,684.

J. K. & Susie L. Wadley Research Institute and Blood Bank: *See*—
Dorn, Gordon L., 3,932,222.

Jabs, Hartmut; and Wiemers, Minny, to Heusch, Severin; Plankermann, Ida; Gattersleben, Anneliese; Gattersleben, Hermann; and Thoennissen, Finny. Helical shear blade. 3,931,750, Cl. 83-672.000.

Jabsen, Felix S., to Babcock & Wilcox Company, The. Industrial technique. 3,932,216, Cl. 176-78.000.

Jackson, Auzville, Jr.: *See*—
Weedle, Rosemary B., 3,931,819.

Jackson, Sydney; and Shepherd, Alan Arthur, to Ferranti, Limited. Apparatus for mounting semiconductor devices. 3,931,922, Cl. 228-6.000.

Jacobs, Christianus, to B.V. Machinefabriek en Ijzergieterij Hollandia-Bergen op Zoom. Butterfly valve. 3,931,955, Cl. 251-305.000.

Jacuzzi Bros. Incorporated: *See*—
Gritz, Darrell D., 3,931,830.

Jaegtnes, Karl O.; and Smith, Millard F., to Westinghouse Electric Corporation. Electrohydraulic emergency trip system and method for a turbine power plate. 3,931,714, Cl. 60-660.000.

Jahnel, Benno: *See*—
Dickopp, Gerhard; and Jahnel, Benno, 3,932,710.

Janicki, Mieczyslaw; Muler, Henryk; and Nijaki, Wladyslaw, to Instytut Prezemyslu Miesnego. Method for dyeing protein articles of food, especially protein casings. 3,932,676, Cl. 426-250.000.

Jankowski, Ollie F. Toilet anti-splash guard. 3,931,649, Cl. 4-1.000.

Janssens, Wilhelmus; Vanheertum, Johannes Josephus; Pollett, Robert Joseph; Sneyers, Hendrik Hubert; and Dierckx, Jozef Aime, to AGFA-GEVAERT N.V. Electrophotographic material. 3,932,418, Cl. 260-288.0CE.

Janszen, Arthur A., to Electrostatic Research Corporation. Wide range speaker system. 3,931,867, Cl. 181-155.000.

Japan Gasoline Co., Ltd.: *See*—
Okagami, Akio; Horie, Akira; and Toida, Tsutomu, 3,932,147.

Japan Steel Works, Ltd.: *See*—
Miyano, Katao; Tomizuka, Shunichi; Adachi, Takao; Takenouchi, Tomoo; Kondo, Satoshi; Hirama, Akira; and Endo, Yasuo, 3,932,200.

Japan Synthetic Rubber Company Limited: *See*—
Maki, Hirohisa; and Kitagawa, Yozo, 3,932,321.

Javerzat, Alex; and Delplanque, Fernand, to Mecaval International. Automatic device for systematically placing elongated products on a conveyor. 3,931,879, Cl. 198-21.000.

Javillonar, Michael A., to Raymond Lee Organization, Inc., The, a part interest. Toothpaste tube supporting device. 3,931,950, Cl. 248-108.000.

Jayawant, Madhusudan D.; and Yates, Paul C., to Du Pont de Nemours, E. I., and Company. Forming highly absorbent, low bulk density sodium silicate by contacting with H_2O_2 and heating to about 45° to 60°C. 3,932,140, Cl. 23-293.00A.

Jaybee Manufacturing Corporation: *See*—
Holmes, Frank A.; and Stansbury, Benjamin H., Jr., 3,931,663.

Jeco Kabushiki Kaisha: *See*—
Iwaki, Koichi; Wakabayashi, Atsushi; Nagahori, Yukihiro; and Nakagawa, Shiro, 3,931,705.

Jenaer Glaswerk Schott & Gen.: *See*—
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Jenkins, John P., to International Tapetronics Corporation. Tape marker. 3,932,887, Cl. 360-13.000.

Jensen, Norman P., to Merck & Co., Inc. N-substituted cycloserine compounds, salts thereof, and processes for preparing them. 3,932,439, Cl. 260-307.00A.

Jerabek, Robert D.; and Geiger, William J., to PPG Industries, Inc. Electrodepositable coating compositions containing therein cellulose acetate butyrate and having improved adhesion. 3,932,191, Cl. 106-178.000.

Jilla, Dara Ardeshir, to Martin Processing Co., Inc. Dyeing assistant composition containing organic amines and carboxylic acids for coloring polyester material with acid dyes. 3,932,126, Cl. 8-172.000.

Jintan Terumo Company, Ltd.: *See*—
Takatsuki, Nobuyuki, 3,931,815.

Joffre, Robert L. Applicator especially adapted for applying fluids to bowling lanes and the like. 3,932,043, Cl. 401-137.000.

Johansson, Folke Karl Evald: *See*—
Collin, Per Harald; and Johansson, Folke Karl Evald, 3,932,173.

John Mohr & Sons: *See*—
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Johns-Manville Corporation: *See*—
Lamar, Richard Seyb; and Scheffel, Norman Bach, 3,932,194.
Thiele, William Charles, 3,931,836.

Johns, Robert C., Jr., to Clark Equipment Company. Rear ejector roller and guide for scraper. 3,931,687, Cl. 37-8.000.

Johnson, David A.; Brundidge, Steven P.; Vulcano, Albert L.; Sapino, Chester, Jr.; Mahan, James; and Grossman, Joseph H., to Bristol-Myers Company. Process for the preparation of 7-aminocephalosporanic acids. 3,932,392, Cl. 260-243.00C.

Johnson, Eugene R.; and Mower, Morris F., to Bliss & Laughlin Industries, Inc. Corner finishing tool. 3,932,101, Cl. 425-458.000.

Johnson, Herbert J.: *See*—
Rose, William L.; and Johnson, Herbert J., 3,931,801.

Johnson & Johnson: *See*—
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Johnson, Marvin F. L., to Atlantic Richfield Company. Method for determining hydrocarbon hydrotreating activity of a catalyst prior to its use in a hydrotreating process. 3,932,270, Cl. 208-216.000.

Johnson, McVoy. Motorcycle rack for vehicles. 3,931,903, Cl. 214-450.000.

Johnson, Michael R.; Schaaf, Thomas K.; Bindra, Jasjit S.; Hess, Hans-Jurgen E.; and Eggler, James F., to Pfizer Inc. 2-Descarboxy-2-(tetrazol-5-yl)-11-desoxy-15-substituted-ω-pentanorprostaglandins. 3,932,389, Cl. 260-240.00R.

Johnson Service Company: *See*—
Hayes, Thomas Edward, 3,931,806.

Johnston, William V. Side and corner glare eye shade. 3,932,031, Cl. 351-47.000.

Jondahl, Thor: *See*—
Pasternack, George; and Jondahl, Thor, 3,932,346.

Jones, Charles, to Curtiss-Wright Corporation. Rotor and sealing grid for rotary engines. 3,932,075, Cl. 418-121.000.

Jones, Howard: *See*—
Shen, Tsung-Ying; Jones, Howard; and Fordice, Michael W., 3,932,498.

Jones, Lloyd G.: *See*—
Fitch, John L.; and Jones, Lloyd G., 3,931,715.

Jones, Norman E., to Peabody Galion Corporation. Apparatus for dumping open-topped trash containers. 3,931,901, Cl. 214-302.000.

Jones, Walter C., to Rubber Dynamics Corporation. Life vest. 3,931,657, Cl. 9-342.000.

Jones, William E., to Eli Lilly and Company. Dimeric indole alkaloid purification process. 3,932,417, Cl. 260-287.00R.

Jordan, Terence B.: *See*—
McCoy, David R.; Jordan, Terence B.; and Ward, Frank K., 3,932,460.

Jouhaud, Yves Pierre: *See*—
Doin, Bernard Jean Felix Victor; Grebert, Robert Omer Emmanuel; and Jouhaud, Yves Pierre, 3,931,709.

Jung, Christopher; and Pappo, Raphael, to G. D. Searle & Co. Mono- and dialkylated prostynoic acid derivatives. 3,932,496, Cl. 260-514.00D.

Junod, Pierre, to Ciba-Geigy AG. Process for the manufacture of doped silver halides. 3,932,292, Cl. 252-62.30R.

Jurewicz, Anthony T.; and Young, Lewis Brewster, to Mobil Oil Corporation. V-P-Zr Catalysts and method of preparation thereof in the absence of hydrogen halide. 3,932,305, Cl. 252-429.00R.

Jury, Harold Rex; and Hay, John Henry, to Comalco (J. & S.) Pty. Limited. Mesh reinforced elastomeric polymers. 3,932,249, Cl. 156-213.000.

K. & W. Scott Trust: *See*—
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Kabel-und Metallwerke Gutehoffnungshuette Aktiengesellschaft: *See*—
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Kabushiki Kaisha Komatsu Seisakusho: *See*—
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Kabushiki Kaisha Saikosha Seisakusho: *See*—
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Kai, Fumio: *See*—
Sekizawa, Yasuharu; Seki, Shigeo; Nomiya, Bunzo; Koeda, Takemi; Kai, Fumio; Akai, Naotoshi; Yusa, Yasushi; and Fukuyasu, Fuguaki, 3,932,668.

Kaiser Aluminum & Chemical Corporation: *See*—
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Kaiser, Kent: *See*—
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Shaffer, Gary W.; Kitchens, Garry C.; and Kaiser, Kent, 3,932,516.

Kakei, Mitsuo; Nishida, Keijiro; Kasahara, Tadayoshi; Shimabayashi, Masao; Hiraga, Ryozo; Nakano, Tomomasa; and Komatsubara, Ichiro, to Canon Kabushiki Kaisha. Vapor deposition apparatus. 3,931,789, Cl. 118-49.000.

Kalthoff, Clement H.: *See—*
Arter, Nelson K.; Eichhorn, Thomas F.; and Kalthoff, Clement H., 3,932,894.

Kameishi, Yoshihiko: *See—*
Irie, Toshio; Yokoyama, Yasuo; Kameishi, Yoshihiko; Yamaguchi, Katsuo; and Hamachi, Kazuo, 3,932,237.

Kamosaki, Minoru; and Asai, Sigel, to Daicel Ltd. Nylon coating composition. 3,932,340, Cl. 260-33.40R.

Kan, Takahiro: *See—*
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Kane, Bernard J.; and Von Genk, Richard A., to SCM Corporation. Process for preparing unsaturated terpene alcohols. 3,932,539, Cl. 260-631.500.

Kane, Gabriel. Tactile numeric display device. 3,932,869, Cl. 340-407.000.

Kaneda, Takuji; Nagao, Makoto; Honjo, Satoru; and Mizuki, Eiichi, to Fuji Photo Film Co., Ltd. Thermodevelopable photographic material containing high silver ion conducting substance. 3,932,189, Cl. 96-114.600.

Kanouse, Roy E.; and Kanouse, Wayne F., to Raymond Lee Organization, Inc., The, a part interest. Snow cycle. 3,931,983, Cl. 280-12.140.

Kanouse, Wayne F.: *See—*
Kanouse, Roy E.; and Kanouse, Wayne F., 3,931,983.

Kansai Paint Company, Ltd.: *See—*
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Kao Soap Co., Ltd.: *See—*
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Fujino, Takashi; and Matsui, Riyouichi, 3,932,295.
Inamoto, Yoshiaki; and Aigami, Koji, 3,932,492.
Takamori, Shigeru; Morimoto, Eizi; and Sakaguchi, Kahei, 3,932,556.

Karami, Hamzeh, to Colgate-Palmolive Company. Reusable adhesive diaper fastener. 3,931,666, Cl. 24-73.0VA.

Karch, Hermine, administratrix: *See—*
Karch, Ludwig, deceased, 3,931,767.

Karch, Ludwig, deceased (by Karch, Hermine, administratrix), to Messerschmitt-Bolkow-Blohm GmbH. Magnetic suspension railway. 3,931,767, Cl. 104-130.000.

Kardys, Joseph A., to Pfizer Inc. High potency vitamin water dispersible formulations. 3,932,634, Cl. 424-237.000.

Karnobatsky, Eduard Konstantinovich; Linnik, Dmitry Grigorievich; and Stovbur, Ivan Yakovlevich. Machine for conditioning ore heat-treating furnace throat. 3,931,898, Cl. 214-32.000.

Kartman, Walter. Mold for thermoforming plastic sheet material. 3,932,096, Cl. 425-398.000.

Kasahara, Tadayoshi: *See—*
Kakei, Mitsuo; Nishida, Keijiro; Kasahara, Tadayoshi; Shimabayashi, Masao; Hiraga, Ryozo; Nakano, Tomomasa; and Komatsubara, Ichiro, 3,931,789.

Kasamatsu, Tadashi. Extruder. 3,932,086, Cl. 425-208.000.

Kaspers, Helmut: *See—*
Buttner, Gerhard; Sasse, Klaus; Hammann, Ingeborg; and Kaspers, Helmut, 3,932,406.

Kasuga, Masao: *See—*
Takahashi, Nobuaki; and Kasuga, Masao, 3,932,768.

Kasyan, Vladimir Khrisanfovich: *See—*
Berdyansky, Mark Grigorievich; Khodak, Zarislav Zakharovich; Veevnik, Vladimir Fomich; Dovgan, Vladimir Semenovich; Bashkatov, Vladimir Porfirievich; Kasyan, Vladimir Khrisanfovich; Bezkrovny, Konstantin Fedorovich; and Tsekhnovich, Lev Izrailevich, 3,931,724.

Katsuda, Yoshio, to Dainippon Jochugiku Kabushiki Kaisha. Substituted furfurylesters of chrysantheumumic acid. 3,932,470, Cl. 260-347.400.

Katz, Bruno: *See—*
Grantham, LeRoy F.; Gehri, Dennis C.; and Katz, Bruno, 3,932,587.

Katz, Murray; and Kaufman, Arthur, to Union Technologies Corporation. Method for catalyzing a fuel cell electrode and an electrode so produced. 3,932,197, Cl. 136-120.0FC.

Kaufman, Arthur: *See—*
Katz, Murray; and Kaufman, Arthur, 3,932,197.

Kaugars, Girts, to Upjohn Company, The. Anthelmintic methods employing benzoyl chloride phenylhydrazones. 3,932,661, Cl. 424-327.000.

Kaugars, Girts: *See—*
Moon, Malcolm W.; and Kaugars, Girts, 3,932,662.

Kawabe, Ushio; Yamamoto, Shigehiko; Aita, Toshiyuki; and Honda, Yukio, to Hitachi, Ltd. Hexaboride electron emissive material. 3,932,314, Cl. 252-521.000.

Kawada, Tadao. Surge comparison type coil tester. 3,932,806, Cl. 324-51.000.

Kawai, Atushi: *See—*
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Kawakami, Kazuo; Imagome, Hiroshi; Ishizaki, Sumio; and Sugiyama, Genpei, to Hodogaya Kagaku Kogyo Kabushiki Kaisha. Process for the dyeing of modified polyester fibers. 3,932,121, Cl. 8-21.00C.

Kawamata, Yasuo: *See—*
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Kawasaki Steel Corporation: *See—*
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Irie, Toshio; Yokoyama, Yasuo; Kameishi, Yoshihiko; Yamaguchi, Katsuo; and Hamachi, Kazuo, 3,932,237.

Kawazu, Takashi. Pipe-connecting device and pipes. 3,932,046, Cl. 403-172.000.

Kayano, Tatsuo: *See—*
Yanagimachi, Akio; Yamada, Osamu; Yamane, Hisakichi; Sawabe, Eiichi; Uehara, Takashi; Yoshino, Takehiko; Takezawa, Teruhiro; Masuda, Michio; Nabeyama, Hiroaki; Fukuda, Masaaki; and Kayano, Tatsuo, 3,932,698.

Kazmierowicz, Casimir W., to Beckman Instruments, Inc. Constant temperature coefficient thick film thermistor. 3,932,312, Cl. 252-518.000.

Keaton, Clyde D. Method and apparatus for making laminated board with a pocketed core. 3,932,248, Cl. 156-210.000.

Keeley, James R.; and Everson, Russell. Automatic fire alarm. 3,931,785, Cl. 116-106.000.

Keijzer, Johan H.: *See—*
Fader, John H.; Keijzer, Johan H.; Graulus, Marcel J. R.; and Beets, Roland H. C., 3,931,961.

Keishin Matsumoto Director-General of the Agency of Industrial Science and Technology: *See—*
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Keller & Knappich Augsburg Zweigniederlassung der Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft: *See—*
Ganowski, Franz-Josef, 3,932,725.

Keller, Robert A., to Echlin Manufacturing Company, The. Internal combustion engine turbocharger pressure control regulators. 3,931,712, Cl. 60-602.000.

Kelly, Charles J.: *See—*
Fork, Frank W.; Lindner, Robert G.; Kelly, Charles J.; and Albrecht, Raymond E., 3,932,696.

Kennavane, John J., to Sanders Associates, Inc. Computer terminal. 3,932,842, Cl. 340-172.500.

Kennecott Copper Corporation: *See—*
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O'Day, William R., Jr.; Bensky, Norman D.; and Le Blanc, James D., 3,932,344.

Kenney, Donald Sykes: *See—*
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Kenworthy, Max H., to All-Steel, Inc. Flush pull arrangement for office furniture. 3,932,010, Cl. 312-320.000.

Kerber, Horst: *See—*
Strohmeyer, Max; Walz, Helmut; Appl, Max; Moell, Hans; Kerber, Horst; and Hohenschutz, Heinz, 3,932,523.

Kest, Donald O.; and Questel, John M. Heat sealable adhesive product and method of making the same. 3,932,558, Cl. 260-841.000.

Kewish, Ralph W., Jr.: *See—*
Dike, Robert S.; and Kewish, Ralph W., Jr., 3,932,717.

Khan, Ausat Ali: *See—*
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Khodak, Zarislav Zakharovich: *See—*
Berdyansky, Mark Grigorievich; Khodak, Zarislav Zakharovich; Veevnik, Vladimir Fomich; Dovgan, Vladimir Semenovich; Bashkatov, Vladimir Porfirievich; Kasyan, Vladimir Khrisanfovich; Bezkrovny, Konstantin Fedorovich; and Tsekhnovich, Lev Izrailevich, 3,931,724.

Kichizo Niwa: *See—*
Abe, Zenuemon; Tanaka, Kunio; Hotta, Masao; and Imai, Masaaki, 3,932,805.

Kido, Jitsuo. Apparatus for separating a mixed liquid containing components of different specific gravities. 3,931,928, Cl. 233-21.000.

Kikkoman Shoyu Co., Ltd.: *See—*
Yokotsuka, Tamotsu; Iwaasa, Takashi; Okami, Tadao; Noda, Minoru; and Fujii, Mitsuharu, 3,932,671.

Kimberly-Clark Corporation: *See—*
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Kimura, Tetsuo: *See—*
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King, Henry L., to Monsanto Company. Method of preparing phosphorus-bromine containing fire retardant polyester fibers. 3,932,351, Cl. 260-45.70P.

King, James Claude, to Biliey Electric Company. Vacuum electrolysis of quartz. 3,932,777, Cl. 310-8.000.

King, John M.; and Bakker, Nicolaas, to Chevron Research Company. Preparation of overbased carbonated sulfurized magnesium alkylphenates. 3,932,289, Cl. 252-42.700.

King-Seeley Thermos Co.: *See—*
Kohl, Vance L., 3,931,911.
Nelson, David M., 3,931,805.

Kircher, Morton S.; and Wood, Judson A., to Olin Corporation. Electrode assembly for an electrolytic cell. 3,932,261, Cl. 204-288.000.

Kishimoto, Akira: *See—*
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Kitagawa, Yozo: *See—*
Maki, Hirohisa; and Kitagawa, Yozo, 3,932,321.

Kitamura, Yoshishige, to Nippon Electric Co., Inc. MIS type integrated circuit device. 3,932,884, Cl. 357-41.000.

Kitchens, Garry C.: *See—*
Shaffer, Gary W.; Kitchens, Garry C.; and Kaiser, Kent, 3,932,515.
Shaffer, Gary W.; Kitchens, Garry C.; and Kaiser, Kent, 3,932,516.

Klasek, F. A.: *See—*
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Klatskin, Jerome Barnard; and Rosen, Arye, to RCA Corporation. Method of electrically interconnecting semiconductor elements. 3,932,226, Cl. 204-16.000.

Klauke, Erich; Schmitz, Reinhold; and Bien, Hans-Samuel, to Bayer Aktiengesellschaft. Process for the manufacture of 1-nitroanthraquinone. 3,932,473, Cl. 260-369.000.

Kletschka, Harold D.; and Rafferty, Edson H., to Bio-Medicus, Inc. Suture bridges. 3,931,821, Cl. 128-335.000.

Klingler, Jerome J. Mirror and guide device for a tractor. 3,932,028, Cl. 350-307.000.

Kliphuis, Jans. Servo control positioning apparatus including a standing wave detector. 3,932,795, Cl. 318-669.000.

Kloimstein, Engelbert: *See—*
Schonbeck, Rupert; Kloimstein, Engelbert; Mayr, Hubert; Diskus, Alfred; and Auer, Engelbert, 3,932,405.

Knapp, Ronald Ralph, to Yamaha International Corporation. Bicycle. 3,931,990, Cl. 280-283.000.

Knebel, Eric. Collapsible cart. 3,931,985, Cl. 280-42.000.

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Knoell, Lawrence H., to Hoerner Waldorf Corporation. Apparatus for lining cartons. 3,932,105, Cl. 425-504.000.

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Kohl, Vance L., to King-Seeley Thermos Co. Ice dispensing machine. 3,931,911, Cl. 222-56.000.

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Kojima, Masakazu: *See—*
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Kakei, Mitsuo; Nishida, Keijiro; Kasahara, Tarlayoshi; Shimabayashi, Masao; Hiraga, Ryozo; Nakano, Tomomasa; and Komatsubara, Ichiro, 3,931,789.

Kominami, Nobuya; and Tamura, Nobuhiro, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing tert-butylstyrene. 3,932,549, Cl. 260-669.00R.

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Korff, Wolfram G.; Emery, Vernon V.; Bond, Joseph Kim; and Hash, Robert S., to Emery Company, Inc. Multiple station plastic pipe belling machine. 3,932,094, Cl. 425-393.000.

Korpman, Ralf, to Johnson & Johnson. Hot melt adhesive composition and tape. 3,932,328, Cl. 260-27.0BB.

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Krabetz, Richard: *See—*
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Kramer, Edward J. Extendable educational module. 3,931,771, Cl. 108-77.000.

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Krammer, Herbert: *See—*
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Kreithen, Marvin L.; and Lawler, John J., Jr., to Textron, Inc. Control system for producing multi-axis contour movement for a stepping motor drive. 3,932,796, Cl. 318-685.000.

Krenzer, John, to Velsicol Chemical Corporation. 1-Thiadiazolyl-6-alkoxytetrahydropyrimidinones. 3,932,410, Cl. 260-256.50R.

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Kreuder, Hans Joachim: *See—*
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Krutak, James J., Sr.; Haase, Jan R.; and Landholm, Richard A., to Eastman Kodak Company. Magenta image-providing phenylazonaphthyl dyes. 3,932,380, Cl. 260-197.000.

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Kubelka, Axel, to Gertsch AG. Release binding for skis. 3,931,982, Cl. 280-11.35D.

Kucsma, Michael E.; Babcock, Gary J.; and Harris, Berlin C., Jr., to Ethyl Corporation. Process for producing glass fiber reinforced injection molding compounds. 3,932,573, Cl. 264-118.000.

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Kunzel, Hans-Egon; Wolf, Gerhard Dieter; Bierling, Robert; Petersen, Siegfried; Nischk, Gunther; and Steinhoff, Dieter, to Bayer Aktiengesellschaft. Urethane derivatives of 2-phenyl-4(3H)-quinazolones. 3,932,409, Cl. 260-256.40Q.

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Kurata, Masaharu: *See*—
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Kurei, Hiroshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Film winding and shutter release error prevention apparatus. 3,932,878, Cl. 354-153.000.

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Kuttner, Ralph; and Morrison, Wallace T., to Stoody Company. Apparatus for applying solid particle material to a strip. 3,931,787, Cl. 118-8.000.

Kuznetsov, Evgeny Fedorovich: *See*—
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Labes, Mortimer M., to Temple University. Nematic liquid crystals with charge-transfer acceptors as dopants. 3,932,298, Cl. 252-299.000.

Labuda, Edward Franklin; and Ryden, William Dennis, to Bell Telephone Laboratories, Incorporated. Suppression of X-ray radiation during sputter-etching. 3,932,232, Cl. 204-192.000.

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Ladin, Eli M., to Federal-Mogul Corporation. Self-aligning clutch bearing assembly. 3,931,875, Cl. 192-98.000.

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Lambert, Jean-Louis: *See*—
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Lambert, Roy E.: *See*—
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Landgraf, Helmut; and Forster, Herbert, to Mannesmann Aktiengesellschaft. Apparatus for feeding and distributing steel melts. 3,931,850, Cl. 164-281.000.

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Larsh, Everett P. Stabilizer unit for marine vessels. 3,931,781, Cl. 114-126.000.

Larsson, Hans Gunnar; and Bergman, Carl, to Allmanna Svenska Elektriska Aktiebolaget. Method of isostatic hot pressing of powder. 3,932,178, Cl. 75-226.000.

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Lau, George W., to Binks Manufacturing Company. Spray booth. 3,932,151, Cl. 55-229.000.

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Lehman, Leon M., to Hydrocarbon Research, Inc. Hydrogenation of hydrocarbon residuum. 3,932,269, Cl. 208-157.000.

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Lenton, R. Warren: *See*—
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Loft, John T.; Plovan, Steven G.; and Vogt, Clifford M., to Celanese Corporation. Air permeable waterproof products having fabric-like aesthetic properties and methods for making the same. 3,932,682, Cl. 428-296.000.

Long, Richard L.: *See—*
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Luenser, Kurt K., to Verson Allsteel Press Company. Method and system for detecting brake wear in a metal forming machine. 3,931,727, Cl. 72-444.000.

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Luscher, Jakob; and Rusznyak, Andre. Control system for periodically energizing a capacitive load. 3,932,773, Cl. 307-270.000.

Luscombe, Terry L. Inflatable boat. 3,931,655, Cl. 9-2.00A.

Lustgarten, David M.: *See—*
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MacGregor, William W., to Honeywell Information Systems, Inc. Multifrequency drive clock. 3,932,816, Cl. 328-61.000.

Mackay, Angus Campbell: *See—*
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Madsen, Kristian Dahl, to Allmanna Svenska Elektriska Aktiebolaget. Turbo-generator rotor with a rotor winding and a method of securing the rotor winding. 3,932,779, Cl. 310-215.000.

Maeda, Shin: *See—*
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Magee, Thomas A., to Diamond Shamrock Corporation. Azide. 3,932,471, Cl. 260-349.000.

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Main, Duane C., to General Foods Corporation. Method for timed cooking of a food product. 3,932,675, Cl. 426-233.000.

Maki, Hirohisa; and Kitagawa, Yozo, to Japan Synthetic Rubber Company Limited; and Dai-Ichi Kogyo Seyaku Co. Ltd. Flame-retardant polymer composition. 3,932,321, Cl. 260-17.40R.

Malisch, Roman; Titus, Otmar; and Puttinger, Dietmar, to Messerschmitt-Bolkow-Blohm GmbH. Accelerator switch. 3,931,764, Cl. 102-70.20R.

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Marchello, John L. Bicycle chain cleaning tray. 3,931,991, Cl. 280-295.000.

Margraf, Harry W., to Rescue Products, Inc. Siver-heparin-allantoin complex. 3,932,627, Cl. 424-183.000.

Marici, Frank N. Automatic alternating cuff endo tracheal tube inflator. 3,931,822, Cl. 128-351.000.

Marini, Adriana; and Marini, Giacomo. Method and apparatus for the manufacture of sheets for holding postage stamps or the like. 3,932,259, Cl. 156-510.000.

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Marker, Hannes. Safety ski binding system. 3,931,980, Cl. 280-11.35R.

Markhart, Albert H.; and Santer, James O., to Monsanto Company. Electroconductive resins and process of preparation. 3,932,564, Cl. 260-899.000.

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Martino, Lawrence A.: *See—*
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Massa, Frank; and Massa, Donald P., to Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees of the Stoneleigh Trust u/d/t Dec. 4, 1973. Instrument for direct measurement of the velocity of sound in a fluid. 3,932,833, Cl. 340-5.00S.

Massachusetts Institute of Technology: *See—*
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Massie, Philip E. Sealed pump and drive circuits therefor. 3,932,792, Cl. 318-119.000.

Mastrolia, Edmund J.; and Michigian, Harry J., to Aerojet-General Corporation. Stabilizers for functionally terminated butadiene polymers. 3,932,353, Cl. 260-45.75G.

Masuda, Michio: *See—*
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Masumoto, Hakaru; and Watanabe, Kiyoshi, to Foundation: The Research Institute of Electric and Magnetic Alloys, The. Cobalt-aluminum magnetic materials with high coercive force. 3,932,204, Cl. 148-103.000.

Matsubara, Takashi; Takeuchi, Yuko; Tanaka, Tadashi; Obi, Tatsuro; and Watanabe, Akio, to Nippon Steel Corporation; and Toagosei Chemical Industry Co., Ltd. Coated metallic sheet for use in making a container. 3,932,144, Cl. 29-195.000.

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Matsuura, Katsumi, to Konishiroku Photo Industry Co., Inc. Multilayer photosensitive material for color photography. 3,932,185, Cl. 96-74.000.

Matthews, Joseph S., to Gulf Research & Development Company. Reactive hydrophilic epoxy containing polymer. 3,932,557, Cl. 260-837.00R.

Matthias, Guenther: *See—*
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Maxwell, Bryce. Vented hopper with improved feed system. 3,932,115, Cl. 432-5.000.

Maxwell, Ian Stuart, to Babcock & Wilcox, Limited. Electric arc fusion welding apparatus. 3,932,728, Cl. 219-131.00R.

Mayeux, Jean-Claude: *See—*
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McAlhaney, Norman E. Bale-handling equipment. 3,931,899, Cl. 214-38.0CC.

McAllister, Wayne D.; and Polster, Louis S. Keyed control device for machines and other instrumentalities. 3,932,732, Cl. 235-92.0CT.

McCain, David L., to Continental Oil Company. Apparatus for hydraulically transporting solids. 3,931,999, Cl. 302-14.000.

McCain Manufacturing Corporation: *See—*
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McCarthur, Connie M. Hair dressing cosmetic. 3,932,611, Cl. 424-70.000.

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McClaskey, Boyd M., to Narco Scientific Industries, Inc. Out of lock detector for phase lock loop synthesizer. 3,932,821, Cl. 331-25.000.

McCloskey, Albert R.; and Williams, Gordon T., to Rockwell International Corporation. Bearing having a self-lubricating liner and method of making. 3,932,008, Cl. 308-238.000.

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McConnell, Richard L.; Taylor, Robert B.; and Grant, Peter M., to Eastman Kodak Company. Powder coating composition comprising a particulate form of a carboxylated polyolefin. 3,932,368, Cl. 260-78.40D.

McCord, Thomas J., to Raymond Lee Organization, Inc., The, a part interest. Door device. 3,931,691, Cl. 43-61.000.

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McCoy, David R.; Jordan, Terence B.; and Ward, Frank K., to Texaco Inc. Method for the preparation of a tetraalkyl-tetraoxa-undecane. 3,932,460, Cl. 260-340.700.

McDermott, Clifton Eugene; and Wareham, Franklin Dee, to Bio-Logics Products, Inc. Method and apparatus for separating blood fractions. 3,932,277, Cl. 210-77.000.

McDonnell Douglas Corporation: *See—*
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McFarland, James D., Jr., to Edelbrock Equipment Co. Independent runner intake manifold for a V-8 internal combustion engine having each runner in a direct path with a throat of a four-throat carburetor. 3,931,811, Cl. 123-52.00M.

McGathey, Wendell H. Rotary-piston internal combustion engine. 3,931,810, Cl. 123-44.00E.

McGill Manufacturing Company, Inc.: *See—*
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McGuire, Joseph C., to McDonnell Douglas Corporation. Long term vent structure. 3,931,835, Cl. 138-42.000.

McKelvey, Wilfred G., to Western Engineering & Mfg. Co. Variable pitch axial fan. 3,932,054, Cl. 415-130.000.

McKeon, John F.; and Lambert, Roy E., to FMC Corporation. Method of making a bushing link chain. 3,931,706, Cl. 59-4.000.

McLaughlin, Ivan Patrick: *See—*
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McLeod, Gordon D., to G. D. McLeod & Sons, Incorporated. Product and process. 3,932,339, Cl. 260-32.8SB.

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McNish, Thomas Gordon. Fibrous insulating materials. 3,932,161, Cl. 65-3.000.

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McWhinnie, David A., Jr.; Viero, Laurence G.; and Freeburg, Donald J., to Oxequip Health Industries. Valved service outlet. 3,931,829, Cl. 137-329.100.

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Sekizawa, Yasuharu; Seki, Shigeo; Nomiya, Bunzo; Koeda, Takemi; Kai, Fumio; Akai, Naotoshi; Yusa, Yasushi; and Fukuyasu, Fuguaki, 3,932,668.

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Melkersson, Karl-Axel, to Boliden Aktiebolag. Method for the purification of sulphuric acid containing mercury. 3,932,149, Cl. 55-72.000.

Memmer, James A., to General Motors Corporation. Engine overspeed control of retarder. 3,931,870, Cl. 188-296.000.

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Merle, William E. Portable power saw apparatus. 3,931,676, Cl. 30-371.000.

Merlo, Fabrizio; Battisti, Ruggero; and Domenis, Danilo, to Montecatini Edison S.p.A.; and Aziende Colori Nazionali Affini Acna S.p.A. Hydrosoluble monoazoic cationic dyes and process for preparing same. 3,932,377, Cl. 260-158.000.

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Merser, Francis G.; and Kooistra, Philip A., to Dennison Manufacturing Company. Interlocking attachment device. 3,931,667, Cl. 24-150.0FP.

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Metscher, Klaus: *See*—
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Mewes, Arthur Raymond; Styron, Robert W.; and Smith, Mark Harris, to AMAX Resource Recovery Systems, Inc. Process for the treatment of mineral slimes. 3,932,275, Cl. 210-49.000.

Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Farbenfabriken Bayer AG. Pharmaceutical compositions containing unsymmetrical esters of 1,4-dihydropyridine 3,5-dicarboxylic acid. 3,932,645, Cl. 424-266.000.

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Meyer, Jerome W.: *See*—
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Miller, Edward E.; and Ranft, Eberhard V., to Raymond International, Inc. Support barge method and apparatus. 3,931,778, Cl. 114-26.000.

Miller, Henry F., to Uniroyal Inc. Elastomeric railway car with side bearing. 3,932,005, Cl. 308-138.000.

Miller, Kent A. Disposal device for wheelchairs. 3,931,650, Cl. 4-134.000.

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Mirtain, Henri J., to Uniroyal, S.A. Cushioned tread tire. 3,931,844, Cl. 152-360.000.

Mita, Yoh; and Nagasawa, Eiji, to Nippon Electric Co., Inc. Electroluminescent device including dichroic and infrared reflecting components. 3,932,881, Cl. 357-17.000.

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Miyamoto, Mamoru: *See*—
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Miyano, Katao; Tomizuka, Shunichi; Adachi, Takao; Takenouchi, Tomoo; Kondo, Satoshi; Hirama, Akira; and Endo, Yasuo, to Japan Steel Works, Ltd. Flux for a build-up welding. 3,932,200, Cl. 148-26.000.

Miyano, Masateru, to G. D. Searle & Co. Process for the production of 2β-formyl 3α-protected hydroxy-5-oxocyclopentane-1α-heptanoic acids and esters corresponding. 3,932,467, Cl. 260-345.700.

Miyazaki, Tetuo; Munemiya, Sunao; and Tasaka, Akira, to Sumitomo Chemical Company, Limited. Process for producing trimethyl-p-benzoquinone. 3,932,475, Cl. 260-396.00R.

Miyazawa, Makoto: *See—*
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Moon, Howard R., to Wahl Clipper Corporation. Brush and methods for manufacturing same. 3,931,826, Cl. 132-9.000.
Moon, Malcolm W.; and Kaugars, Girts, to Upjohn Company, The. Method of treating animals and formulations therefor. 3,932,662, Cl. 424-327.000.
Mooney, Walter E.: *See—*
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Moore, Glenn Ellis, Jr., to Bell Telephone Laboratories, Incorporated. Code converter. 3,932,731, Cl. 235-61.11D.
Moore, Joseph E., to Gulf Research & Development Company. Insecticidal phenylhydrazone sulfides. 3,932,660, Cl. 424-327.000.
Moore, Lawrence A., to Beloit Corporation. Blow molding apparatus. 3,932,095, Cl. 425-397.000.
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Moriguchi, Sanseki; Abe, Hiroshi; Saito, Kiyoshi; and Miyazawa, Makoto, to Nippon Kokan Kabushiki Kaisha. Method of removing nitrogen oxides from plant exhaust. 3,932,585, Cl. 423-235.000.
Morikawa, Hiroyuki; and Sato, Takahiro, to Mitsui Petrochemical Industries, Ltd. Process for production of 2,6-dimethyl-1,3,6-octatriene. 3,932,550, Cl. 260-677.00R.
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Morris, James C. Seal for rotary fluid-handling apparatus. 3,932,074, Cl. 418-113.000.
Morris, Thomas A., to United States Steel Corporation. Mechanism for operating the locking means for the chill plate of a rigid starter bar. 3,931,849, Cl. 164-274.000.
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Moser, Herbert, to Gesellschaft fur Kernforschung m.b.H. Apparatus for measuring radiation angle dependence. 3,932,762, Cl. 250-574.000.
Motorola, Inc.: *See—*
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Flowers, Dervin L., 3,932,685.
Pace, Wilson David, 3,932,879.
Mottel, Samuel; and Williamson, David Howard, to Bell Telephone Laboratories, Incorporated. Latch and switch actuator interlock safety structure for electronic component module operable during insertion and removal of connector members. 3,932,716, Cl. 200-50.00A.
Motycka, David L., to United Technologies Corporation. Variable flap for a variable pitch ducted fan propulsor. 3,931,708, Cl. 60-226.00A.
Mourier, Jean, to Benson. Negative pressure detector. 3,931,739, Cl. 73-398.00C.
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Muchnick, Paul, to Harvey Hubbell, Incorporated. Ground fault interrupter with reversed line polarity lamp indicator. 3,932,790, Cl. 317-18.00D.
Mueller, Martin, to Carl Schenck AG, Firma. Method and apparatus for processing two d.c. voltages, especially representing unbalance components. 3,932,740, Cl. 235-186.000.
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Muller, Rolf, to Papst-Motoren KG. Speed control circuit for permanent magnet D-C motors. 3,932,793, Cl. 318-138.000.
Muller, Werner H., to Hoechst Aktiengesellschaft. Process for the preparation of cyclohexanediones-(1,3). 3,932,510, Cl. 260-586.00R.
Muller, Wolfgang: *See—*
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Murphy, Thomas V. Display panel and assembly. 3,931,894, Cl. 211-177.000.
Musick, Charles Ronald; and Torres, Jose Marcelo, to Combustion Engineering, Inc. Permissive analogue logic for the steam relief valves of a nuclear reactor. 3,932,213, Cl. 176-60.000.
Musser, Jerry Lee: *See—*
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Nachbur, Hermann; and Maeder, Arthur, to Ciba-Geigy Corporation. Process for the manufacture of phosphorus-containing condensation products, the products and their use as flameproofing agents. 3,932,502, Cl. 260-553.00B.

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Naegeli, Peter, to Givaudan Corporation. Isopropyl-(3-oxopentenyl)-cyclopentenes. 3,932,517, Cl. 260-586.00R.

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Nagamitsu, Toshiaki, to Daihatsu Motor Company Limited. Connecting device for front and rear frame of tricycle. 3,931,989, Cl. 280-283.000.

Nagano, Ikuo; Saitoh, Kozo; and Tanaka, Hiroshi, to Mitsui Mining & Smelting Co., Ltd. Elecciric preconditioning in selective flotation of oxidic type ores. 3,932,271, Cl. 209-9.000.

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Nahill, Edmond P.; Nahill, James C.; Nahill, William A.; and Nahill, Arthur. Medicine dispensing system. 3,931,885, Cl. 206-44.00R.

Nahill, James C.: *See—*
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Nakanishi, Susumu; and Barth, Wayne E., to Pfizer Inc. Process for preparing 6-chloro-2-chloromethyl-4-phenylquinazoline-3-oxide and intermediates therefor. 3,932,325, Cl. 260-251.00Q.

Nakano, Ryuzo; Fukumoto, Ryoichi; and Fukura, Kenichi, to Aisin Seiki Kabushiki Kaisha. Door hinge unit. 3,931,664, Cl. 16-145.000.

Nakano, Soichi: *See—*
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Nakano, Tomomasa: *See—*
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Nakashio, Seizo; Sekine, Noriyuki; Toyota, Nobuhiro; Fujita, Fumio; and Domoto, Masahiro, to Sumitomo Chemical Company, Limited; and Hayashibara Biochemical Laboratories, Inc. Paper coating material containing pullulan. 3,932,192, Cl. 106-204.000.

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Navarra, Barry A. Infant bathing apparatus. 3,931,652, Cl. 4-177.000.

Nayfa, James E.; and Stanley, Andrew D. Floor cleaning machine with vacuum pickup. 3,931,662, Cl. 15-320.000.

Naylor, Floyd E., to Phillips Petroleum Company. Adhesive compositions. 3,932,327, Cl. 260-27.0BB.

Naylor, Robert R.: *See—*
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Neddenriep, Richard J.: *See—*
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Needham, James M.; and Weber, Robert E., to Bendix Corporation, The. Adaptive braking system reference pull down. 3,932,000, Cl. 303-21.0BE.

Nelson, David M., to King-Seeley Thermos Co. Barbeque grill. 3,931,805, Cl. 126-41.00R.

Nelson, Harold G.: *See—*
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Nescio, John J., to American Home Products Corporation. Sodium 6-(L-aminocyclohexane carboxamido)penicillanic acid. 3,932,386, Cl. 260-239.100.

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Nichol, Francis Richard, Jr.; and Underwood, Gerald E., to Upjohn Company, The. Interferon induction. 3,932,617, Cl. 424-85.000.

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Nietzel, Oscar A.: *See—*
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Niki, Shoji, to Takeda Riken Kogyo Kabushikikaisha. Heterodyne receiver system. 3,932,814, Cl. 325-332.000.

Nilsson, Osten Karl Alf; and Lindell, Curt, to Toolex Alpha Aktiebolag. Arrangement in moulding presses with parted press tools for the production of hot-pressed plastic material products, especially grammophone records. 3,932,087, Cl. 425-215.000.

Nippo Communication Industrial Co., Ltd.: *See—*
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Nippon Electric Company, Ltd.: *See—*
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Nishijima, Komio; and Kojima, Masakazu, to Kabushiki Kaisha Komatsu Seisakusho. Skiving cutter device for use in cutting internal spur gear. 3,931,754, Cl. 90-7.000.

Nishino, Atsushi; Kumano, Hiroshi; and Sonetaka, Kazunori, to Matsushita Electric Industrial Co., Ltd. Method of making reaction bed material for artificial mineral water production. 3,932,578, Cl. 264-331.000.

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Novis, Leonard, to Atlas Automation, Inc. Bar unscrambler. 3,931,896, Cl. 214-1.00P.

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Nudelman, Abraham; and McCaully, Ronald J., to American Home Products Corporation. 3-Halo-cepham derivatives. 3,932,398, Cl. 260-243.00C.

Nudenberg, Walter: *See—*
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Nukushina, Yasuhiko: *See—*
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Nurimoto, Seiichi: *See—*
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Obara, Heitaro; Onodera, Junichi; Matukuma, Akira; and Yoshida, Kenji, to Mitsubishi Chemical Industries, Limited. Process for producing pyrogallol and derivatives thereof. 3,932,538, Cl. 260-625.000.

Obata, Akira; and Saito, Takashi, to Nippo Communication Industrial Co., Ltd. Push button body for a push-button switch providing snap-action of the switch. 3,932,722, Cl. 200-340.000.

Obata, Yoshio: *See—*
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O'Brien, Gerard J., deceased; and O'Brien, Catherine H., executrix. Transmission of voice or sound through telegraphy. 3,932,711, Cl. 179-142.000.

O'Brien, John Terence; and Ariyan, Zaven S., to Uniroyal Inc. Novel o-triazenobenzamides, in treating aggressive behavior. 3,932,633, Cl. 424-226.000.

Ocean Drilling & Exploration Company: *See—*
childers, Mark A.; and Dawkins, Enoch L., 3,931,782.

O'Day, William R., Jr.; Bensky, Norman D.; and Le Blanc, James D., to Kennecott Copper Corporation. Composite wire containing a mixture of phenolic and thermoplastic resins as a binder. 3,932,344, Cl. 260-38.000.

O'Day, William R., *Jr.*: *See—*
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Oehm, Klaus; Seiffert, Ulrich; Struwe, Burckhard; Fiala, Ernst; Bauer, Andreas; Weissner, Ruediger; and Schwanz, Wilfried, to Volkswagenwerk Aktiengesellschaft. Vehicle safety device. 3,931,988, Cl. 280-150.00B.

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O'Hare, Edward C.; and DeVries, Wallace J., Sr., to Dahlman, Inc. Demountable multi-row potato combine. 3,931,857, Cl. 171-14.000.

Ohki, Eiji; Saeki, Hiromichi; and Sugawara, Shinichi, to Sankyo Company Limited. Dideoxybutirosin derivative. 3,932,382, Cl. 260-210.0AB.

Ohnishi, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Electrophotographic recording system with plate cleaning. 3,932,877, Cl. 346-74.00P.

Ohno, Isao: *See—*
Okuno, Yoshitoshi; Hirano, Masachika; Ohno, Isao; Takeda, Hisami; Magara, Osamu; Itaya, Nobushige; Nishioka, Toshio; Mizutani, Toshio; Ohno, Nobuo; and Matsuo, Takashi, 3,932,459.

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Okada, Akira: *See—*
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Okagami, Akio; Horie, Akira; and Toida, Tsutomu, to Japan Gasoline Co., Ltd. Method of reforming hydrocarbons. 3,932,147, Cl. 48-214.000.

Okajima, Yoshiaki: *See—*
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Okami, Tadao: *See—*
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Okamoto, Miyoshi; Watanabe, Koji; Nukushina, Yasuhiko; and Konosu, Makoto, to Toray Industries, Inc. Fibrous configuration composed of a plurality of mutually entangled bundles of fine fibers. 3,932,687, Cl. 428-288.000.

Okano, Shigeru: *See—*
Hibino, Toshihiko; Suzuki, Yoshio; Okano, Shigeru; Hara, Yoichi; and Sato, Etsuro, 3,932,400.

Oki Electric Industry Company, Ltd.: *See—*
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Okuda, Yukio: *See—*
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Okuno, Yoshitoshi; Hirano, Masachika; Ohno, Isao; Takeda, Hisami; Magara, Osamu; Itaya, Nobushige; Nishioka, Toshio; Mizutani, Toshio; Ohno, Nobuo; and Matsuo, Takashi, to Sumitomo Chemical Company, Limited. Novel cyclopropanecarboxylic acid esters. 3,932,459, Cl. 260-332.20A.

Old Phoenix National Bank, executor: *See—*
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Olmstead, John Aaron, to RCA Corporation. Improved fluid flow sensor configuration. 3,931,736, Cl. 73-204.000.

Olsen, Bengt; Blomster, Jens; Buss, Nils; Stenkvist, Bjorn; and Preuss, Lucien. Automatic focusing of an optical system. 3,932,733, Cl. 235-151.000.

Olsen, Frederick C.: *See—*
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Ooue, Shingo: *See—*
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Orefice, James D.: *See—*
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Orndorff, Roy L., Jr., to B. F. Goodrich Company, The. Rubber bearing with non-metallic support member. 3,932,004, Cl. 308-238.000.

Orr, Clyde, Jr.: *See—*
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Orth, Dieter: *See—*
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Osaki, Yoshiyasu: *See—*
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Osborn, Leroy Gordon; and Brownlee, George Hunnam, to Westrex Company Limited. Cinematograph projectors. 3,932,033, Cl. 352-228.000.

Oshima, Yasuhiro. Method of making thermoplastic resin mattings. 3,932,247, Cl. 156-148.000.

Oshiyama, Masahiro: *See—*
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Ossbahr, Carl Gilbert Richard. Modular article conveyor. 3,931,882, Cl. 198-165.000.

O'Sullivan, Denis J.; and Casey, T. Eisirt, to Loctite (Ireland) Limited. Dental filling method and composition formed thereby. 3,931,678, Cl. 32-15.000.

Oswald, Joseph V. Multi-range, high-speed A.C. over-current protection means including a static switch. 3,932,791, Cl. 317-33.0SC.

Otake, Nobuyuki; Sato, Yukinori; and Ando, Kozo, to Tokyo Boshi Kabushiki Kaisha. Pen point for writing instruments. 3,932,044, Cl. 401-265.000.

Otis, George A. Surface washer. 3,931,931, Cl. 239-287.000.

Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See—*
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Otsuka, Masatomi: *See—*
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Owens-Corning Fiberglas Corporation: *See—*
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Owens, John C. Pocket-size combination storage and display cases for insignia members. 3,931,688, Cl. 40-1.500.

Oxequip Health Industries: *See—*
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Pader, Morton: *See—*
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Paget, Charles J.; and Wikel, James H., to Eli Lilly and Company. N-2-(6-hydroxybenzothiazolyl)-N'-phenyl (or substituted phenyl) ureas. 3,932,434, Cl. 260-305.000.

Paget, Charles J.: *See—*
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Palethorpe, George; and Folk, Edwin W., to Monsanto Company. Method for making void-free acrylic fibers. 3,932,577, Cl. 264-182.000.

Palmiter, James A. Divider for use in the occupant compartment of vehicle. 3,931,994, Cl. 296-24.00R.

Palosi, Eva: *See—*
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Pals, Raimond; Fuchs, Robert J.; and Schwartz, John C., to FMC Corporation. Process for preparing medium density granular sodium tripolyphosphate. 3,932,590, Cl. 423-315.000.

Pansini, Andrew L. Leaf trap kit for swimming pools. 3,932,281, Cl. 210-163.000.

Panzarino, Joseph N.: *See—*
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Pappo, Raphael: *See—*
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Papst-Motoren KG: *See—*
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Paramonoff, Elpidifor; and Olsen, Frederick C., to Standun, Inc. Device for monitoring fluid pressure in mechanisms such as hydrostatic fluid bearings. 3,931,738, Cl. 73-389.000.

Parish, Roger G.: *See—*
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Parsons, Brian Jeremy, to Hawker Siddeley Dynamics Limited. Binary parallel adder employing high speed gating circuitry. 3,932,734, Cl. 235-175.000.

Parsons, Stuart L.; and Wasserlein, Henry George, Jr., to AMP Incorporated. Electrical connections for closely spaced conductors and apparatus for forming such connections. 3,932,018, Cl. 339-99.00R.

Partyka, Anthony: *See—*
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Pasternack, George; and Jondahl, Thor, to Continental Can Company, Inc. Pigmented photopolymerizable compounds stabilized against premature gelation with thiocarbamates. 3,932,346, Cl. 260-42.210.

Pastor, Ricardo C., to Hughes Aircraft Company. Purification of alkali metal halides. 3,932,597, Cl. 423-499.000.

Pastoriza, James J., to Analog Devices, Inc. Digital-to-analog converters. 3,932,863, Cl. 340-347.0DA.

Patel, Pravin, to Concorde Fibers, Inc. Apparatus for and method of melt spinning. 3,932,576, Cl. 264-178.00F.

Patellis, Anargiros Pete: *See—*
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Payne, Donald. Pile splice for concrete and steel piles of various configuration. 3,931,716, Cl. 61-53.000.

Payne, Ralph, to FEI, Inc. Sanitary roller conveyor. 3,931,878, Cl. 193-37.000.

Peabody Galion Corporation: *See—*
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Pearce, Peter J., to Synestructics, Inc. Modular curved surface space structures. 3,931,697, Cl. 52-80.000.

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Peel, Mervyn Evan: *See—*
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Peeters, Jozef C. I.; De Roeck, Lucien Joannes Maria; and Van Boort, Henricus Johannes Joseph; to U.S. Philips Corporation. High pressure sodium vapor discharge lamp. 3,932,781, Cl. 313/25.

Penisson, Rene, to Rhone-Poulenc-Textile. Preparation of high molecular weight polymer from oxalic acid and para-phenylene diisocyanate. 3,932,365, Cl. 260-78.00R.

Pennsylvania Crusher Corporation: *See—*
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Pennwalt Corporation: *See—*
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Daigle, Donald J.; Pepperman, Armand B., Jr.; and Boudreaux, Gordon J., 3,932,390.

Peppler, Stanley R. K. Pill container with pocket. 3,931,891, Cl. 206-538.000.

Perez-Albuerne, Evelio A., to Eastman Kodak Company. Electrophotographic element containing a polymeric multi-phase interlayer. 3,932,179, Cl. 96-1.500.

Peripheral Equipment Corporation: *See—*
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Perkins, Joan Mary: *See—*
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Perronnet, Jacques; and Taliani, Laurent, to Roussel-UCLAF. Pesticidal phosphorous-thiazole compounds. 3,932,433, Cl. 260-302.00E.

Perronnet, Jacques; and Girault, Pierre, to Roussel-UCLAF. Benzimidazoles. 3,932,447, Cl. 260-309.200.

Perry, Robert J., to Phillips Petroleum Company. Selective addition of additives to solid polymer. 3,932,323, Cl. 260-23.00H.

Personal Products Company: *See—*
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Peter, Heinrich; Rodriguez, Herman Robert; and Bickel, Hans, to Ciba-Geigy Corporation. 3-R-methyl-7-amino-ceph-em-4-carboxylic acid compounds. 3,932,465, Cl. 260-243.00C.

Peters, Philip H., Jr., to Environment/One Corporation. Induction cooking unit having all pan safe operation, wide range power control and low start-up and shut-down transients. 3,932,801, Cl. 321-45.00C.

Petersen, Siegfried: *See—*
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Petry, Eston F.; and Umphrey, Ronald W., to Continental Oil Company. Apparatus for crushing solids in a liquid medium. 3,931,936, Cl. 241-46.150.
Pfefferkorn, Kurt; and Serou, Charles, to Diethelm AG. Floor treating machine. 3,931,659, Cl. 15-49.00R.
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Phillips, William, to RCA Corporation. Method for the reduction of iron in iron-doped lithium niobate crystals. 3,932,299, Cl. 252-300.000.
Piascinski, Joseph John, to RCA Corporation. Conditioning partially-completed CRT bulb assembly for storage and/or transit. 3,932,011, Cl. 316-17.000.
Pichon, Bernadette: *See*—
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Poincenot, Rene. Device for clamping together two machine members having mating centering means. 3,931,979, Cl. 279-107.000.
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Porat, Chaim. Intrusion detector. 3,932,718, Cl. 200-61.930.
Porat, Eli, to Intel Corporation. Feedback circuit for allowing rapid charging and discharging of a sense node in a static memory. 3,932,848, Cl. 340-173.00R.
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Portalier, Pierre Louis, to Societe Nationale des Poudres et Explosifs. Solid propellant designed to burn centripetally and its use in rocket engines or other motors. 3,931,765, Cl. 102-99.000.
Porter, John H.; and Swift, Robert O., to Ametek, Inc. Electric motor fan unit for wet working air. 3,932,070, Cl. 417-423.00A.
Porter, Rick Anthony. Space dyed yarn production using dense foams. 3,932,129, Cl. 8-176.000.
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Jerabek, Robert D.; and Geiger, William J., 3,932,191.
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Press, Lorence. Record manufacturing equipment. 3,932,097, Cl. 425-407.000.
Preuss, Friedrich; and Difflipp, Kurt, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Mechanism for applying lacquers and the like on a printing press. 3,931,791, Cl. 118-236.000.
Preuss, Lucien: *See*—
Olsen, Bengt; Blomster, Jens; Buss, Nils; Stenkvist, Bjorn; and Preuss, Lucien, 3,932,733.
Price, Albert E.; and Mowatt-Larssen, Erling, to General American Transporation Corporation. Hopper vehicle. 3,931,768, Cl. 105-240.000.
Price, Stephen E.: *See*—
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Procter & Gamble Company, The: *See*—
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Proudfit, James R., to General Tire & Rubber Company, The. Apparatus for forming composite articles. 3,932,107, Cl. 425-509.000.
Puccio, John: *See*—
Puccio, Paul; and Puccio, John, 3,931,772.
Puccio, Paul; and Puccio, John. Article of furniture and method of manufacture. 3,931,772, Cl. 108-161.000.
Pungs, Wolfgang: *See*—
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Purdue Research Foundation: *See*—
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Pylaev, Nikolai Ivanovich; and Ponomarev, Valery Yakovlevich. Antifriction polymeric material and a composition thereof. 3,932,286, Cl. 252-12.400.
Quaker Oats Company, The: *See*—
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Quarmby, Robert C.: *See*—
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Rachel, Todd Leonard, to Bendix Corporation, The. Altitude compensation system for a fuel management system. 3,931,808, Cl. 123-32.0EA.

Radiometer A/S: *See—*
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Rafferty, Edson H.: *See—*
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Rahman, Yueh Erh, to United States of America, Energy Research and Development Administration. Liposome encapsulation of chelating agents. 3,932,657, Cl. 424-319.000.

Raichle, Karl: *See—*
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Raighn, Edwin H.; Eglinton, Robert B.; Frazier, Lorne L.; Naylor, Robert R.; and Morris, William R., to Chromalloy American Corporation. Carpet feeding, measuring and rolling apparatus. 3,931,940, Cl. 242-56.00R.

Ramanathan, Visvanathan, to Ciba-Geigy AG. Azo compounds, their manufacture and use. 3,932,122, Cl. 8-41.00C.

Rambaud, Jerome: *See—*
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Rambold, Klaus: *See—*
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Ramsey, Hubert J.; Stone, Samuel M.; and Zucker, Joseph, to GTE Laboratories, Incorporated. Fiber coupled light emitting diode module. 3,932,761, Cl. 250-552.000.

Ramwell, Peter W.; Shio, Hideo; and Shaw, Jane E., to ALZA Corporation. Article of manufacture for instant release of anti-aggregation and non-thrombogenic agents to biological media. 3,932,656, Cl. 424-16.000.

Rand, Henry J., executor: *See—*
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Rasmussen, Chris Royce, to McNeil Laboratories, Incorporated. 2-Aryl-4-(R-methyl)-5-methylimidazoles. 3,932,445, Cl. 260-309.000.

Rathbun, Archie B. Elastic lace and hook fastener. 3,931,686, Cl. 36-51.000.

Rau, Jim Lee; and Miller, Laurence L., to TRW Inc. Controller assembly. 3,931,711, Cl. 60-445.000.

Rauch, Francis Clyde: *See—*
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Ray-Chaudhuri, Dilip K.; Georgoudis, Paul C.; and Stockmann, Hans H., to National Starch and Chemical Corporation. Electrophotographic coating compositions having bromine-containing polymer binders. 3,932,181, Cl. 96-1.500.

Raychem Corporation: *See—*
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Raycher, Robert J., to Tru-Fit Products Corporation. Stud welding apparatus. 3,932,724, Cl. 219-98.000.

Rayl, Martin; and Hanson, Harold Duane, to RCA Corporation. Aerosol detector. 3,932,851, Cl. 340-237.00S.

Raymond International, Inc.: *See—*
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RCA Corporation: *See—*
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Read, Reginald A., Jr. Dashpot solenoid. 3,932,826, Cl. 335-240.000.

Reader, Arthur M., to Celanese Corporation. Phosphonate polymers. 3,932,566, Cl. 260-930.000.

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Reilly, Joseph R., to Monsanto Company. Blow needle assembly. 3,932,084, Cl. 425-182.000.

Reimann, Eberhard, to EVT Energie-und Verfahrenstechik GmbH. Ash removal apparatus for coal-dust firing equipment. 3,931,773, Cl. 110-165.00R.

Reimer, William A.; and Scheuerman, Elmer L., to GTE Automatic Electric Laboratories Incorporated. Component terminal system. 3,932,012, Cl. 339-17.0CF.

Reiss, Karl-Hans, to Siemens Aktiengesellschaft. Ray converter. 3,932,750, Cl. 250-315.00A.

Reissland, Martin-Ulrich: *See—*
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Remington Arms Company, Inc.: *See—*
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Reynolds, George A., to Eastman Kodak Company. Pyrylium dyes having a fused rigidized nitrogen-containing ring. 3,932,415, Cl. 260-286.00R.

Reynolds Metals Company: *See—*
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Reynolds, Thomas G.; and Nietzel, Oscar A., to Texas Instruments Incorporated. Process for manufacture of positive temperature coefficient materials. 3,932,313, Cl. 252-520.000.

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Rhodes, Constantine: *See—*
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Rhone-Poulenc-Textile: *See—*
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Rhone-Progil: *See—*
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Ribas, Rogelio Serge; and Nickerson, John D., to United States Steel Corporation. Process for the manufacture of phosphoric acid with minimized environmental effects. 3,932,591, Cl. 423-319.000.

Rice, Richard M., to Reynolds Metals Company. Die for extruding plastic film. 3,932,103, Cl. 425-467.000.

Richards Manufacturing Company: *See—*
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Richardson Company, The: *See—*
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Richtzenhain, Hermann: *See—*
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Ricoh Electronics, Inc.: *See—*
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Riedl, Max J.; and Ross, Thaddeus C., to Infrared Industries, Inc. Gas analyzer. 3,932,754, Cl. 250-343.000.

Riegel Textile Corporation: *See—*
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Rim, Yong S.: *See—*
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Ringel, Samuel M.: *See—*
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Rinnert, Helmut Kurt, to Globe-Union Inc. Acid filling apparatus for storage batteries. 3,931,840, Cl. 141-1.000.
Risdon, Alan Robert: *See—*
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Ritzmann, Horst, to Polysius AG. Method of burning or sintering fine-grain material. 3,932,117, Cl. 432-14.000.
Rivere, Jean-Pierre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Cylinder-induction responsive electronic fuel feed control carburetors. 3,931,814, Cl. 123-119.00R.
Rizzi, George P., to Procter & Gamble Company, The. Novel dihydrochalcone sweetener compositions. 3,932,678, Cl. 426-548.000.
Robert Bosch G.m.b.H.: *See—*
Eckert, Konrad, 3,931,802.
Wunsch, Steffen, 3,931,744.
Robert, Marcel, to Exxon Research and Engineering Company. Oligomerization of propylene. 3,932,553, Cl. 260-683.15B.
Robins, Norman A.; and Bugajski, Frank H., to Inland Steel Company. Control of coating thickness of hot-dip metal coating. 3,932,683, Cl. 427-349.000.
Roccaforte, Harry I., to Hoerner Waldorf Corporation. Tape cassette hub retainers. 3,931,889, Cl. 206-493.000.
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Rockwell International Corporation: *See—*
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Roden, John S., to Minnesota Mining and Manufacturing Company. Metallic ferromagnetic particles for use in environmentally stable magnetic recording media. 3,932,293, Cl. 252-62.550.
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Roesch, Androniki: *See—*
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Roesch, Egon: *See—*
Braun, Franz; Thiel, Max; Stach, Kurt; Roesch, Egon; and Roesch, Androniki, 3,932,411.
Rogers, Edwin J. High voltage triangular waveform generator. 3,932,817, Cl. 328-128.000.
Rohatgi, Pradeep Kumar, to Bethlehem Steel Corporation. Method for separating and recovering kish graphite from mixtures of kish graphite and fume. 3,932,596, Cl. 423-448.000.
Rohr Industries, Inc.: *See—*
Tantlinger, Keith W., 3,931,770.
Westergren, Don M.; and Mooney, Walter E., 3,931,943.
Rohr, Wolfgang: *See—*
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Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See—*
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Rolfo-Fontana, Gudrun Birgitta Margareta, to Monega Anstalt. Method and device (analysis machine) for simultaneous performance of a number of analyses, especially microanalyses, of standard type on chemical objects. 3,932,131, Cl. 23-230.00R.
Romine, Donald J.: *See—*
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Rona, Peter, to IMI (TAMI) Institute for Research & Development. Solid catalyst for heterogeneous reactions. 3,932,306, Cl. 252-430.000.
Ronzio, Richard A.: *See—*
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Rose, William L.; and Johnson, Herbert J. Fuel vaporizer and control system. 3,931,801, Cl. 123-134.000.
Rosen, Arye: *See—*
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Rosen, Karl Isac Joel, to Aktiebolaget IRO. Thread supply device for textile machines. 3,931,939, Cl. 242-47.010.
Rosenbaum, Larry A., to Koehring Company. S[illegible]ral design pipehead. 3,932,102, Cl. 425-466.000.
Rosenstreich, Joseph; Gubernick, Joseph; and Garone, Frank, to Estee Lauder Inc. Antiperspirant composition. 3,932,609, Cl. 424-68.000.
Ross, Adma Schneller: *See—*
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Ross, Thaddeus C.: *See—*
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Rota, Benjamin: *See—*
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Rothenberg, Howard S., to TRW Inc. Electroformed hermetic glass-metal seal. 3,932,227, Cl. 204-16.000.
Rother, Klaus-Dieter, to Siemens Aktiengesellschaft. Frequency-selective signal receiver for communication equipments, more particularly telephone equipments. 3,932,708, Cl. 179-84.0VF.
Rotondi, Aldo, to U.S. Filter Corporation. Multi-stage blow-pipe construction. 3,932,152, Cl. 55-302.000.
Rouget De Gourcez, Etienne; and Mayeux, Jean-Claude, to Societe Nationale des Poudres et Explosifs. Process for the preparation of phosphine oxides and sulphides. 3,932,524, Cl. 260-606.50P.
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Rowland, Michael Charles; and Wight, David Robert, to British Secretary of State for Defense, The. Photocathodes. 3,932,883, Cl. 357-30.000.
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Rudy, Jerome; Pader, Morton; and Netzbandt, William, to Lever Brothers Company. Shampoo composition. 3,932,610, Cl. 424-70.000.
Ruff, Stanley L. Paperboard container lid convertible into a spoon. 3,931,925, Cl. 229-43.000.
Russell, Donald H.; and Lenton, R. Warren, to Atlantic Richfield Company. Catalysts for the reaction of cyclic nitrile compounds with nucleophilic compounds. 3,932,361, Cl. 260-77.50B.
Russell, Joseph L., to Halcon International, Inc. Cyclohexane oxidation. 3,932,513, Cl. 260-586.0AB.
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Rybicki, Robert C., to United Technologies Corporation. Droop stops for helicopter rotor having elastomeric bearings. 3,932,059, Cl. 416-140.000.
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Safford, Franklin C., to Drever Company. Method and apparatus for quenching pipe. 3,932,238, Cl. 148-131.000.
Sagara, Iwao; Shishikura, Hirohisa; and Anada, Ikuo, to Oki Electric Industry Company, Ltd. Analog-to-digital converter. 3,932,865, Cl. 340-347.0AD.
Sagawa, Takizo, to Rank Xerox Ltd. Device for detecting double sheet feeding. 3,932,755, Cl. 250-349.000.
Sagel, John A.; and Weber, Clarence Edward, to Procter & Gamble Company, The. Free flowing detergent compositions containing benzoate salts. 3,932,316, Cl. 252-532.000.
Saito, Kiyoshi: *See—*
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Saito, Shoichi, to Olympus Optical Co., Ltd. Superminiature cassette tape recorder. 3,932,892, Cl. 360-96.000.
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Saitou, Hisashi, to Kabushiki Kaisha Saikosha Seisakusho. Alarm buzzer device. 3,932,868, Cl. 340-384.00R.
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Sakurai, Nobuo, to Miyairi Kinzai Kenkyusho Company Limited. Method of manufacturing a bacterial preparation consisting of a normal rumen bacterial flora with an improved ability to utilize ammonium salts. 3,932,670, Cl. 426-2.000.
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Salmon, John Kennedy; and Adie, Richard A., to Lundy Electronics & Systems, Inc. Process for screening materials with vibrating screens. 3,932,442, Cl. 209-309.000.
Salza, Silvio. Process for the preparation of protein-free wafers. 3,932,679, Cl. 426-549.000.
Salzberg, Edward. Broad band orthogonal mode junction. 3,932,822, Cl. 333-9.000.
Sanders Associates, Inc.: *See—*
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Sankyo Company Limited: *See—*
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Sansui Electric Co., Ltd.: *See—*
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Saracsan, Jeffrey W., to Goodyear Tire & Rubber Company, The. Method of making an improved tire building sleeve and said sleeve. 3,932,255, Cl. 156-401.000.

Sarkes Tarzian, Inc.: *See—*
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Sartori, Guido; and Lundberg, Robert D., to Exxon Research and Engineering Company. Block copolymers containing olefin sulfur dioxide segments and process for their preparation. 3,932,369, Cl. 260-79.30A.

Sarvay, J. Thomas, to Schlegel Manufacturing Company. Glazing system. 3,931,699, Cl. 52-476.000.

Sasaki, Hiroshi, to Ricoh Electronics, Inc. Computer keyboard circuitry. 3,932,866, Cl. 340-365.00E.

Sasse, Klaus: *See—*
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Sather, Delaine C.: *See—*
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Sato, Masamichi, to Rank Xerox Ltd. Abrasive liquid developing apparatus. 3,931,792, Cl. 118-637.000.

Sato, Masamichi; and Fukushima, Osamu, to Rank Xerox Ltd. Apparatus for transferring a toner image. 3,932,035, Cl. 355-3.00R.

Sato, Shunichi; Kurata, Masaharu; Takao, Toshiyuki; Masaki, Sadao; Notomi, Toru; Gaku, Morio; and Moriya, Takehiko, to Mitsubishi Gas Chemical Co., Ltd. Method for manufacturing metal foil- or plastic film-overlaid laminate. 3,932,250, Cl. 156-213.000.

Sato, Takahiro: *See—*
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Sato, Toru: *See—*
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Sawa, Yoshiro; Hirose, Katsumi; Maeda, Shin; and Hamada, Yoshinori, to Shionogi & Co., Ltd. Dibenzazecines. 3,932,384, Cl. 260-239.00D.

Sawabe, Eiichi: *See—*
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Sayles, David C., to United States of America, Army. Propellants based on bis[N-(trinitroethyl)nitramino]ethane. 3,932,241, Cl. 149-19.300.

Scanni, Iberio E.: *See—*
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Scanni, Nino V.; and Scanni, Iberio E., to Raymond Lee Organization, Inc., The, a part interest. Surfaces produced by interlocking members. 3,931,700, Cl. 52-590.000.

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Schaedler, Raymond J., to Chicago Pneumatic Tool Company. Overspeed saftey control mechanism for rotary tools. 3,932,071, Cl. 418-43.000.

Schaub, Fritz: *See—*
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Schaub, Robert Eugene; Floyd, Middleton Brawner, Jr.; and Weiss, Martin Joseph, to American Cyanamid Company. 11-Deoxy-13-dihydro-prostaglandin-9-ketals. 3,932,463, Cl. 260-340.700.

Schaub, Robert Eugene; and Weiss, Martin Joseph, to American Cyanamid Company. Novel 15-substituted prostanoic acids and esters. 3,932,472, Cl. 260-349.000.

Schaub, Robert Eugene: *See—*
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Schelling, Hans-Peter; and Schaub, Fritz, to Sandoz Ltd., (Sandoz AG). ω-Aliphatic and cycloaliphatic-hydrocarbonoxy-2,6-alkadiene and 2-alkene-1-nitriles. 3,932,483, Cl. 260-465.600.

Schering Corporation: *See—*
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Scheuerman, Elmer L.: *See—*
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Schibbye, Hjalmar; and Englund, Arnold, to Svenska Rotor Maskiner Aktiebolag. Screw rotor machine with spring and fluid biased balancing pistons. 3,932,073, Cl. 418-97.000.

Schievelbein, Vernon Hugo, to Texaco Inc. Method of removing hydrogen sulfide from a gas containing carbon dioxide. 3,932,583, Cl. 423-232.000.

Schlangen, Andrew J., to Trane Company, The. Multi-stage electric heater apparatus and method of control. 3,932,729, Cl. 219-486.000.

Schlegel Manufacturing Company: *See—*
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Schlumberger Technology Corporation: *See—*
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Schmid, Markus, to Concast AG. Method and apparatus for cooling a strand cast in an oscillating mold during continuous casting of metals, especially steel. 3,931,848, Cl. 164-83.000.

Schmidt, Rolf: *See—*
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Schmitt, Karl; Disteldorf, Josef; and Flakus, Werner, to Veba-Chemie Aktiengesellschaft. Polyurethane lacquer composition based on isophorone diisocyanate and diamine bis-aldime. 3,932,357, Cl. 260-75.0NH.

Schmitz, Jurgen, to Gesellschaft fur Kernforschung m.b.H. Method of determining the distance between area under fire and the muzzle of the weapon. 3,932,748, Cl. 250-303.000.

Schmitz, Reinhold: *See—*
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Schneider, George, to Amchem Products, Inc. Coating solution having trivalent chromium and manganese for coating metal surfaces. 3,932,198, Cl. 148-6.200.

Schneider, Horst, to Oxy Metal Industries Corporation. Reactive cold forming lubricant. 3,932,287, Cl. 252-32.500.

Schneider, Johannes; and Pungs, Wolfgang, to Dynamit Nobel Aktiengesellschaft. Amorphous polyamide of C-alkyl substituted diamine and terephthalic acid dialkyl ester having improved electrical creep resistance. 3,932,362, Cl. 260-78.00S.

Schneider, Martin Victor: *See—*
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Schnell, Burkhard, to Zwick & Co. Kommanditgesellschaft. Sliding-joint assembly for test frame or the like. 3,932,007, Cl. 308-238.000.

Scholtz, William R.: *See—*
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Schonbeck, Rupert; Kloimstein, Engelbert; Mayr, Hubert; Diskus, Alfred; and Auer, Engelbert, to Chemie Linz Aktiengesellschaft. Phenylpyridazines. 3,932,405, Cl. 260-250.00A.

Schrape, Peter: *See—*
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Schrock, Richard Royce, to Du Pont de Nemours, E. I., and Company. Cyclooctatetraene complexes of niobium and tantalum. 3,932,477, Cl. 260-429.0CY.

Schuck, Paul R., to J. I. Case Company. Multiple cable chute. 3,931,717, Cl. 61-72.600.

Schulten, Rudolf; Teggers, Johannes; and Bentrop, Roland Schulze, to Rheinische Braunkohlenwerke Aktiengesellschaft. Method of obtaining hydrogen from steam. 3,932,599, Cl. 423-655.000.

Schwab, Kurt, to D. Swarovski & Co., Glasschleiferei. Jewelry Component having mounted stones connected by deformable webs. 3,931,719, Cl. 63-28.000.

Schwachhofer, Ghislain: *See—*
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Schwan, Thomas J., to Morton-Norwich Products, Inc. 5-(P-dimethylaminobenzyl) hydantoin. 3,932,449, Cl. 260-309.500.

Schwan, Thomas J.; and Miles, Nelson J., to Morton-Norwich Products, Inc. 1-Arylmethyl-2-imidazolidinones. 3,932,452, Cl. 260-309.700.

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Schweizer, Walter; and Reissland, Martin-Ulrich, to VDO Adolf Schindling AG. Apparatus for the continuous measurement of the density of a liquid by utilization of the law of refraction. 3,932,038, Cl. 356-133.000.
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Scott, Howard L., to Fabalon, Inc.; K. & W. Scott Trust; Wragg, C. N., Jr.; and Wragg, B., part interest to each. Method of lubricating or softening the skin. 3,932,614, Cl. 424-78.000.
Scott, William B., to General Motors Corporation. Fluid unit rotor. 3,932,061, Cl. 416-180.000.
Screttas, Constantinos G., to National Hellenic Research Foundation, The. Alkali metal-containing, organometallic products. 3,932,545, Cl. 260-665.00R.
Sears, Karl David, to International Telephone and Telegraph Corporation. Etherification of bark extracts and condensed tannins. 3,932,488, Cl. 260-473.500.
Segre, Eugene J., to Syntex Corporation. Novel cyclic progestogen-interrupted estrogen oral contraceptive regimens. 3,932,635, Cl. 424-239.000.
Seiffert, Ulrich: *See—*
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Settepani, Joseph A., to Ortho Pharmaceutical Corporation. Method of inducing infertility in male animals and inhibiting the growth of the prostate. 3,932,651, Cl. 424-270.000.
Setterquist, Robert Alton, to Du Pont de Nemours, E. I., and Company. Tetra(neophyl) zirconium and its use in process for the polymerization of olefins. 3,932,307, Cl. 252-430.000.
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Shaffer, Gary W.; Kitchens, Garry C.; and Kaiser, Kent, to Givaudan Corporation. Novel oxygenated derivatives of thujopsene. 3,932,515, Cl. 260-586.00F.
Shaffer, Gary W.; Kitchens, Garry C.; and Kaiser, Kent, to Givaudan Corporation. Novel oxygenated derivatives of thujopsene. 3,932,516, Cl. 260-586.00F.
Shah, Ishwarlal D., to United States of America, Interior. Use of scavenger in recovery of metal values. 3,932,170, Cl. 75-7.000.
Shah, Kanu G., to Richardson Company, The. Thermoplastic urethane compound having low compression set and high modulus. 3,932,337, Cl. 260-29.1SB.
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Sharma, Vijay Ratna: *See—*
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Shaw, Philip E.; Daum, Sol J.; and Clarke, Robert L., to Sterling Drug Inc. Polyhydro-2-phenanthrylideneacetic acids and esters thereof. 3,932,482, Cl. 260-468.500.
Shea, John J., Jr., to Richards Manufacturing Company. Stapedial prosthesis. 3,931,648, Cl. 3-1.900.
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Shen, Tsung-Ying; Jones, Howard; and Fordice, Michael W., to Merck & Co., Inc. 3-Indenyl-γ-(ketobutyric)-acid compounds. 3,932,498, Cl. 260-515.00A.
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Shimabayashi, Masao: *See—*
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Shine, William P., to Dual-Lite Company. Illuminated sign housing construction. 3,931,689, Cl. 40-132.00R.
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Shirley, Orie W., to Datron Systems, Inc. Gyroscope. 3,931,742, Cl. 74-5.700.
Shirley, Ronald A.; and DeLong, Robert J., to Spectrol Electronics Corporation. Variable resistance device. 3,932,831, Cl. 338-143.000.
Shishikura, Hirohisa: *See—*
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Showa Denko Kabushiki Kaisha: *See—*
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Simpson, Robert E.: *See—*
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Simpson, Ronald Olin: *See—*
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Simpson, William R. J., to Sandoz, Inc. 1-(4-Hydroxyalkylpiperazino)-isoquinoline nitrates. 3,932,412, Cl. 260-268.0BQ.
Singer Company, The: *See—*
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Singer, Franz, to Compur-Werk Gesellschaft. Sound recording and reproducing apparatus. 3,932,893, Cl. 360-130.000.
Sisk, Hollis D., to Wagner Electric Corporation. Blower blade for electric motors. 3,932,062, Cl. 416-230.000.
Sitnichenko, Valentin Mikhailovich; Zamuruev, Alexandr Mikhailovich; and Kogut, Andrei Isakovich. Photo-copying device. 3,932,743, Cl. 250-202.000.
Sitter, David N., to General Electric Company. Method and apparatus for controlling circuitry with a plurality of switching means. 3,932,838, Cl. 340-146.1AB.
Sitter, Matthew M.: *See—*
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Skidmore, Paul E. Gas aerating carburetor. 3,932,567, Cl. 261-30.000.
Sklena, Martin L.; Balent, Russell P.; and Greer, Phillip E., to GTI Corporation. Component handler with fluid controlled memory. 3,931,892, Cl. 209-74.00M.
Sleight, Arthur W., to Du Pont de Nemours, E. I., and Company. Superconductive barium-lead-bismuth oxides. 3,932,315, Cl. 252-521.000.
Slip-Not Corporation: *See—*
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Smith, Charles P., Jr. Emergency rescue device. 3,931,868, Cl. 182-63.000.
Smith, David F. Plaster of Paris bandages bonded with minimal proportions of hydrolyzed polyvinyl esters. 3,932,190, Cl. 106-111.000.
Smith, Francis V. Particulate material spreading apparatus. 3,931,934, Cl. 239-657.000.
Smith, Frank R.: *See—*
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Smith, George N.; and Marshall, John J. Convertible pack frame with compressor flaps for supporting a tent in different modes. 3,931,918, Cl. 224-10.000.
Smith, James O.; and Gade, John J., to Inn-Tronics. Master antenna line communication system. 3,932,858, Cl. 340-280.000.
Smith Kline & French Laboratories, Inc.: *See—*
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Smithwick, Edward L., Jr., to Eli Lilly and Company. Process for t-butylating hydroxy- or thiol-substituted amino acids. 3,932,489, Cl. 260-482.00C.
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Snopko, Paul A., to Zenith Radio Corporation. Focus tracking registration for optical reproducing systems. 3,932,700, Cl. 178-6.60R.
Societe de Promotion et d'Exploitation Industrielles de Procedes de Brevets S.A.: *See—*
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Societe des Verreries Industrielles Reunies du Loing: *See—*
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Societe Generale de Constructions Electriques et Mecaniques Alsthom & Cie: *See—*
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Societe Nationale des Poudres et Explosifs: *See—*
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Soltysik, Edmund John, to Illinois Tool Works Inc. Terminal block mounting bracket. 3,931,946, Cl. 248-68.00R.
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Soteropulos, Gust; and Meiers, Gerald Franklyn, to Deere & Company. Machine for forming cylindrical hay bales. 3,931,702, Cl. 56-341.000.
Soucy, Kenneth Wilfred; Plunkett, Thomas James; and Rowlands, Kenneth Charles, to Remington Arms Company, Inc. Action bar-action spring link using flexible wire. 3,931,690, Cl. 42-16.000.
Spann, Donald C. Leg positioner. 3,931,654, Cl. 5-327.000.
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Sprokel, Gerard J., to International Business Machines Corporation. Liquid crystal display assembly having dielectric coated electrodes. 3,932,026, Cl. 350-160.0LC.
Staab, Joachim; Apel, Willy; Drager, Achim; Haberditz, Wilhelm-Rudiger; and Fabinksi, Walter, to Hartmann & Braun Aktiengesellschaft. Construction unit for two beam photometers. 3,932,041, Cl. 356-229.000.
Stach, Kurt: *See—*
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Stevens, Mario R.; and Vickers, John Michael, to California Institute of Technology. Portable electrophoresis apparatus using minimum electrolyte. 3,932,262, Cl. 204-299.000.
Stickney, Michael E., to Durrum Instrument Corporation. Integrated flow path block. 3,932,136, Cl. 23-259.000.
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Stoughton, Richard B., to Nelson Research & Development Co. Composition and method for topical administration of griseofulvin. 3,932,653, Cl. 424-285.000.
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Stream, Ralph M., to Owens-Corning Fiberglas Corporation. Apparatus for producing a sliver-like fibrous product. 3,932,163, Cl. 65-9.000.
Streicher, Michael A., to Du Pont de Nemours, E. I., and Company. Chromium, molybdenum ferritic stainless steels. 3,932,174, Cl. 75-124.000.
Streicher, Michael A., to Du Pont de Nemours, E. I., and Company. Chromium, molybdenum ferritic stainless steels. 3,932,175, Cl. 75-126.00C.
Stretanski, Joseph Anthony, to American Cyanamid Company. Light stabilizer compositions for polymers. 3,932,324, Cl. 260-23.00H.
Strohmeyer, Max; Walz, Helmut; Appl, Max; Moell, Hans; Kerber, Horst; and Hohenschutz, Heinz, to BASF Aktiengesellschaft. Process for preventing the formation of an emulsion when working up reaction mixtures containing butyraldehydes and cobalt. 3,932,523, Cl. 260-604.0HF.
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Sugiyama, Yukio; and Sumi, Tsuyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Noise reduction device for automotive vehicles. 3,931,863, Cl. 180-71.000.
Suh, John T., to Richardson-Merrell Inc. N-[4-(3,4-methylenedioxyphenyl)-but-2-yl]-β-(3,4-dihydroxyphenyl)ethylamine, and salts thereof. 3,932,461, Cl. 260-340.500.
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Surmatis, Joseph Donald, to Hoffmann-La Roche Inc. Improved preparation of Wittig salt of vinyl β-ionol. 3,932,485, Cl. 260-468.00L.
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Suverkropp, Geertrudes H., to Stamicarbon B.V. Process for optical resolution of racemic lysine sulphanilate. 3,932,491, Cl. 260-501.120.
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Tagnon, Luc Andre, to Essilor International (Compagnie Generale d'Optique). Adjustable base, notably for topometry apparatus. 3,931,947, Cl. 248-180.000.

Tai, Harold, to Barry Wright Corporation. Vane damping. 3,932,056, Cl. 415-174.000.

Takada, Takezo, to Takata Kojyo Co., Ltd. Motor vehicle safety devices. 3,931,866, Cl. 180-82.00C.

Takagi, Toru, to Kansai Paint Company, Ltd. Curable polyester resin composition for hydrophilic coatings. 3,932,356, Cl. 260-75.0EP.

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Takahashi, Nobuaki; and Kasuga, Masao, to Victor Company of Japan, Ltd. Limiting amplifier. 3,932,768, Cl. 307-237.000.

Takahashi, Noriyoshi: *See—*
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Takahashi, Shiro, to Shionogi & Co., Ltd. 3-[1-Hydroxy-2-(3- or 4-hydroxypiperidino)ethyl]-5-phenylisoxazole. 3,932,426, Cl. 260-293.670.

Takahashi, Susumu; and Ito, Ryosuke, to Sansui Electric Co., Ltd. Signal synthesizing system adaptable for discrete four-channel sound reproducing system and matrix four-channel sound reproducing system. 3,932,706, Cl. 179-1.0GQ.

Takahashi, Toru, to Canon Kabushiki Kaisha. Developer concentration detecting and replenishment device. 3,932,034, Cl. 355-3.0DD.

Takahashi, Yasushi: *See—*
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Takeda, Kiyoshi; and Yabu, Toshiomi, to Matsushita Electric Industrial Co., Ltd. Magnetic recording and reproducing system having an automatic tape drive control function. 3,932,889, Cl. 360-71.000.

Takeda, Mikio; Inoue, Hirozumi; Hayashi, Goro; and Nurimoto, Seiichi, to Tanabe Seiyaku Co., Ltd. Novel azabicyclo octane derivative and process for preparing same. 3,932,429, Cl. 260-295.50B.

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Tamag/Basel AG: *See—*
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Tamai, Hisashi; and Nakano, Soichi, to Honda Giken Kogyo Kabushiki Kaisha. Adiabatic integral intake and exhaust conduit for internal combustion engine. 3,931,799, Cl. 123-122.0AB.

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Tamano, Motokazu; Noda, Tomimitsu; and Yoshioka, Masanobu, to Tokyo Shibaura Electric Co., Ltd. Electronic range with automatic electronic digital timer. 3,932,723, Cl. 219-10.55B.

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Tanaka, Hiroshi: *See—*
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Tate, Bryce E.: *See—*
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Tatsuta Densen Kabushiki Kaisha: *See—*
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Tauzin, Francis, to Pomagalski S.A.; and Sigma Plastique. Automatic opening and closing cabin for ropeways. 3,931,769, Cl. 105-329.00S.
Tayler, Colin Andrew Millar, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defense in Her Britannic Majesty's Government of the. Rotary bladed fluid flow machine. 3,932,064, Cl. 417-243.000.
Taylor, John Anthony: *See—*
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Taylor, Lloyd D.: *See—*
Grasshoff, J. Michael; and Taylor, Lloyd D., 3,932,480.
Taylor, Norman J., to Varian Associates. Electron gun. 3,932,749, Cl. 250-306.000.
Taylor, Robert B.: *See—*
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TED Bildplatten Aktiengesellschaft, AEG-Telefunken, TELDEC: *See—*
Dickopp, Gerhard; and Jahnel, Benno, 3,932,710.
Tee-Pak, Inc.: *See—*
Burke, Noel I., 3,932,677.
Teed, Richard K., to Riegel Textile Corporation. Apparatus for coating a web of material with a liquid. 3,931,786, Cl. 118-6.000.
Teele, John C.: *See—*
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Teggers, Johannes: *See—*
Schulten, Rudolf; Teggers, Johannes; and Bentrop, Roland Schulze, 3,932,599.
Teller, Aaron J., to Teller Environmental Systems, Inc. Selective chromatographic separation of sulfur dioxide with organic reagents. 3,932,589, Cl. 423-244.000.
Teller Environmental Systems, Inc.: *See—*
Teller, Aaron J., 3,932,589.
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Terkelsen, Bruce E., to United Technologies Corporation. Method and apparatus for production of directionally solidified components. 3,931,847, Cl. 164-4.000.
Terrell, Ross C., to Airco, Inc. Ether compound as an inhalation anesthetic. 3,932,667, Cl. 424-342.000.
Tertinek, Christian T.; and Stone, Alan J. Adjustable gear enclosure for mixer pinion and bull gears. 3,931,748, Cl. 74-606.00R.
Tertinek, Christian T.; and Stone, Alan J. Paddle shaft seal assembly. 3,932,006, Cl. 308-187.000.
Testi, Angel Rogelio: *See—*
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Textron, Inc.: *See—*
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Thelen, Hermann; Halcour, Kurt; Schwerdtel, Wulf; and Swodenk, Wolfgang, to Bayer Aktiengesellschaft. Catalyst for the preparation of cyclohexanone from phenol and process therefor. 3,932,514, Cl. 260-586.00P.
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Dunlay, John B.; and Howard, Robert C., 3,932,776.
Thermoplastic Processes, Inc.: *See—*
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Thibault, Olida. Hydraulic wheel. 3,932,076, Cl. 418-177.000.
Thibodeaux, John D. Lifting apparatus. 3,931,957, Cl. 254-127.000.
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Thoma, Wilhelm; Hildebrand, Dietrich; Last, Wolf-Dieter; and Rinke, Heinrich, to Bayer Aktiengesellschaft. Process for the production of basic modified polyamides. 3,932,366, Cl. 260-78.00L.
Thomas-Castelnau, Philippe: *See—*
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Thomson, Derek Vincent. Surfboard leash. 3,931,656, Cl. 9-310.00E.
Thorborg, Kjeld: *See—*
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Throckmorton, James R., to Minnesota Mining and Manufacturing Company. Polyfluoromethylthio-substituted compounds. 3,932,508, Cl. 260-566.0AC.
Thrush, James Lloyd, to Anchor Hocking Corporation. Candle holder unit and the like. 3,932,113, Cl. 431-297.000.
Thunberg, Jon Carl; Bragdon, Robert Wright; and Moore, William Philip, to W. R. Grace & Co. Process for recovering beta-alanine from sodium chloride solutions. 3,932,501, Cl. 260-534.000.
Thurston, Benjamin L. Box section cover member. 3,931,923, Cl. 229-23.00R.
Tiby, Gerard A., to Hobart Corporation. Peeler and grater apparatus. 3,931,900, Cl. 241-296.000.
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Timex Corporation: *See—*
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Tinder, Lawrence E. Die stone casting for dental restoration. 3,931,677, Cl. 32-11.000.
Titus, Otmar: *See—*
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Todd, Lee T., Jr.; Farrell, Eugene F.; and Linz, Arthur, to Massachusetts Institute of Technology. Process for preparing cathodochromic sodalite. 3,932,592, Cl. 423-328.000.
Toida, Tsutomu: *See—*
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Tominaga, Hiroshi; and Takamatsu, Masanobu, to Tokyo Sharyo Seizo Kabushiki Kaisha. Watch case and method for manufacturing the same. 3,931,704, Cl. 58-88.00R.
Tomizuka, Shunichi: *See—*
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Toray Industries, Inc.: *See—*
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Torpey, Wilbur N.; and Sullivan, Richard A., to Autotrol Corporation. Method for the primary and secondary treatment of wastewater in a unitary apparatus. 3,932,273, Cl. 210-17.000.
Torres, Jose Marcelo: *See—*
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Touchette, John W., to Goodyear Tire & Rubber Company, The. Tire building drum. 3,932,256, Cl. 156-417.000.
Townhill, Arthur. Adjustable golf club. 3,931,969, Cl. 273-79.000.
Townsend Engineering Company: *See—*
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Townsend, Peter G., to General Motors Corporation. Polyphase rectifier system for providing two output current-voltage ranges. 3,932,765, Cl. 307-149.000.

Townsend, Ray T., to Townsend Engineering Company. Stripper means for meat skinning machines. 3,931,665, Cl. 17-21.000.

Toyo Seikan Kaisha Limited: *See—*
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Trane Company, The: *See—*
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Traunecker, Werner: *See—*
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Trelut, Jean Marie; Liot, Jean Bernard Michel; Cagnac, Therese Marie Leonie; and Chambet-Falquet, Antoine Jean Louis, to International Standard Electric Corporation. Real-time control arrangement for a simulation device. 3,932,843, Cl. 340-172.500.

Tremont, Leo J. Portable, gravity-actuated alarm for use with a window or door. 3,932,856, Cl. 340-274.00R.

Treuner, Uwe: *See—*
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Tripp, Maurice R. Three-dimensional television. 3,932,699, Cl. 178-6.500.

Troemel, Gerhard: *See—*
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Trolle, Sten, to AB Carbox. Portal press. 3,931,728, Cl. 72-455.000.

Tru-Fit Products Corporation: *See—*
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True, Cecil Wayne. Electrically heated riser pipe for a fluid supply system. 3,932,727, Cl. 219-301.000.

Truman, George H., to A. P. Green Refractories Co. Gun for applying refractory material. 3,931,959, Cl. 259-151.000.

TRW Inc.: *See—*
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Turnbull, James O'Hara; Merritt, William Lipscomb; and McLaughlin, Ivan Patrick, to J. J. Baker Company Limited. Vapor chamber for drying. 3,931,684, Cl. 34-242.000.

Turner, Gordon James, to W. R. Grace & Co. Reduction firing of ceramics composited with organic binders. 3,932,310, Cl. 252-455.00R.

Turner, Robert Bruce, to American Medical Electronics Corporation. Apparatus for making probe covers for electronic thermometers. 3,932,108, Cl. 425-515.000.

Turner, William W., to Eli Lilly and Company. 3,3-(Alkylimino)bis(2-methylenepropiophenone)microbiocides. 3,932,493, Cl. 260-501.180.

Tylko, Jozef Kazimierz, to Tetronics Research and Development Company. Process for high temperature treatment of materials. 3,932,171, Cl. 75-10.00R.

Ueda, Bunzo: *See—*
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Ueda, Hiroyuki; Sawano, Yukio; and Ooue, Shingo, to Fuji Photo Film Co., Ltd. Card printer. 3,932,036, Cl. 355-40.000.

Ueda, Yuji: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,932,528.

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Ueki, Yoshiharu; Maruyama, Yoshio; Magata, Yoshihiro; Fushimi, Akihiro; and Shimizu, Katsuhisa, to Pioneer Electronic Corporation. Device for eliminating tape slack in a magnetic tape recording and reproducing apparatus. 3,932,890, Cl. 360-75.000.

Uemura, Osamu; Fujita, Kiyoshi; and Onoda, Takeshi, to Showa Denko Kabushiki Kaisha. Apparatus for manufacture of tubular film from thermoplastic resin. 3,932,080, Cl. 425-71.000.

Umezawa, Hamao; Takahashi, Yasushi; Shirai, Tadashi; and Fujii, Akio, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Bleomycinic acid and process for preparing thereof. 3,932,374, Cl. 260-112.50R.

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United Kingdom of Great Britain and Northern Ireland, Secretary of State for Industry in Her Britannic Majesty's Government of the: *See—*
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Valdettaro, Alarico A., to Sarkes Tarzian, Inc. Compact speed reduction mechanism for a uhf indicator dial. 3,931,743, Cl. 74-10.540.

Van Benthuysen, John D., to CTS Corporation. Plug-in shaft for electrical control. 3,932,832, Cl. 338-166.000.

Van Boort, Henricus Joannes Joseph: *See—*
Peeters, Jozef C. I.; De Roeck, Lucien Joannes Maria; and Van Boort, Henricus Johannes Joseph, 3,932,781.

Van Brunt, George H. Filter area limiting device for drip coffee makers with micropore filter. 3,931,756, Cl. 99-306.000.

Vance, James C., Sr.: *See—*
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van der Lely, Cornelis. Convertible agricultural implements and machines. 3,931,859, Cl. 172-247.000.

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Vann, Roy R.; and George, Flint R., to Vann Tool Company, Inc. Downhole packer actuated vent assembly. 3,931,855, Cl. 166-128.000.

Vann Tool Company, Inc.: *See—*
Vann, Roy R.; and George, Flint R., 3,931,855.

Van Scott, Eugene J.; and Yu, Ruey J. Process for the treatment of acne vulgaris utilizing retinal. 3,932,665, Cl. 424-333.000.

Van Uitert, LeGrand Gerard: *See—*
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Vdoviak, John William, to General Electric Company. Augmentor flameholding apparatus. 3,931,707, Cl. 60-39.72R.

VEB Rathenower Optische Werke: *See—*
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Veba-Chemie Aktiengesellschaft: *See—*
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Veevnik, Vladimir Fomich: *See—*
Berdyansky, Mark Grigorievich; Khodak, Zarislav Zakharovich; Veevnik, Vladimir Fomich; Dovgan, Vladimir Semenovich; Bashkatov, Vladimir Porfirievich; Kasyan, Vladimir Khrisanfovich; Bezkrovny, Konstantin Fedorovich; and Tsekhnovich, Lev Izrailevich, 3,931,724.

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Verheijen, Egidius J. M.: *See—*
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Verheyen, Willy; Raes, Andre; Coopmans, Jean-Paul; and Lambert, Jean-Louis, to Glaverbel-Mecaniver S.A. Glass cutting. 3,932,726, Cl. 219-121.0LM.

Verhille, Karel Eugeen, to AGFA-GEVAERT N.V. Formation of electrostatic charge patterns. 3,932,751, Cl. 250-315.000.

Verriere, Philippe: *See—*
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Luenser, Kurt K., 3,931,727.

Vertes, Michael A.; and Ronzio, Richard A., to Amax Inc. Process for purifying technical grade molybdenum oxide. 3,932,580, Cl. 423-56.000.

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Vickers, John Michael: *See—*
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Victor Company of Japan, Ltd.: *See—*
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Viero, Laurence G.: *See—*
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Vignovich, Martin; and Sperry, Russell B. Landfill and soil conditioner. 3,932,166, Cl. 71-11.000.

Vilceanu, Marin; and Bors, Constantin, to Combinatul Chimic Fagaras. Reactor for the catalytic ammonia synthesis at high temperatures and pressures. 3,932,139, Cl. 23-288.00L.

Vincent, Alan Henry; and Cure, Ronald William Lewis, to Westland Aircraft Limited. Bifilar vibration dampers. 3,932,060, Cl. 416-145.000.

Vink, Johannes Albertus. Pellet mill with separate fee means for each die roller. 3,932,091, Cl. 425-331.000.

Vit, Jaroslav. Dental treatment. 3,932,605, Cl. 424-51.000.

Vizvary, Stephen L.: *See—*
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Vockenhuber, Karl: *See—*
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Vogl, Otto F., to Du Pont de Nemours, E. I., and Company. Chloral copolymers. 3,932,318, Cl. 260-2.50F.

Vogt, Clifford M.: *See—*
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Vogts, Arnold, to Kabel-und Metallwerke Gutehoffnungshuette Aktiengesellschaft. Injection molding head for forming honeycombed thermoplastic structures. 3,932,106, Cl. 425-505.000.

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Vollstedt, Thomas J.: *See—*
Meidl, John A.; and Vollstedt, Thomas J., 3,932,278.

Volpe, Richard L., to Rockwell International Corporation. Carrier for shuttleless loom. 3,931,837, Cl. 139-122.00N.

Von Genk, Richard A.; and Cardenas, Carlos G., to SCM Corporation. Process for halogenation of conjugated dienes to dihalogenated butene products. 3,932,543, Cl. 260-654.00H.

Von Genk, Richard A.: *See—*
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von Heitlinger, Eugene, to Schwinn Bicycle Company. Sharp edge tester. 3,931,732, Cl. 73-104.000.

von Rosenberg, Hermann E.: *See—*
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Wada, Toshiya; Nozawa, Tadao; and Takata, Toshihiko, to Nippon Steel Corporation. Method for producing a super low watt loss grain oriented electrical steel sheet. 3,932,236, Cl. 148-113.000.

Waddell, Alistair Tobias, to Foster Wheeler Energy Corporation. Intervane burners. 3,932,110, Cl. 431-184.000.

Wadensten, Theodore S. Noiseless air-actuated turbine-type vibrator with blades arranged in a sidewardly extending annular pattern. 3,932,057, Cl. 415-53.00T.

Wagner Electric Corporation: *See—*
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Wahl Clipper Corporation: *See—*
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Wakabayashi, Atsushi: *See—*
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Walcher, Donald R.: *See—*
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Walding, Eugene C., to Oak Electro/Netics Corporation. Television channel indicator. 3,932,867, Cl. 340-378.00R.

Waldmann, Jacobo. Adjustable antiptosis corset. 3,931,816, Cl. 128-78.000.

Waldrum, John E., to Amchem Products, Inc. Variable spray apparatus and method. 3,931,930, Cl. 239-7.000.

Waligorski, Gordon J.; and McMahan, Roy F., Sr. Security pedestal base. 3,931,949, Cl. 248-418.000.

Walker-Hall-Sears, Inc.: *See—*
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Walker, Jerome F., to Brunswick Corporation. Electronic scorer for bowling games. 3,931,966, Cl. 273-54.00C.

Walker, Michael S.: *See—*
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Wall Industries, Inc.: *See—*
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Walter, Erich: *See—*
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Walter, Lewis A., to Schering Corporation. Certain 2-[α(2-pyridyl)-benzyl] imidazolines and derivatives thereof. 3,932,431, Cl. 260-296.00R.

Walz, Helmut: *See—*
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Ward, Frank K.: *See—*
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Ward, Paul F., to Information Terminals Corporation. Reversible magnetic recording disk unit. 3,932,895, Cl. 360-135.000.

Ware, Peter George; and Mercer, George Kenneth, to Dunlop Limited. Support means for an electrically operated tool. 3,932,015, Cl. 339-58.000.

Wareham, Franklin Dee: *See—*
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Warnant, Julien; Farcilli, Andre; Medici, Italo; and Toromanoff, Edmond, to Roussel-UCLAF. Process for the preparation of glaziovine. 3,932,420, Cl. 260-289.00A.

Warncke, Heinz, to Bayer Aktiengesellschaft. Self-equalizing industrial photometer. 3,932,040, Cl. 356-201.000.

Warner-Lambert Company: *See—*
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Connor, David T.; Ringel, Samuel M.; and von Strandtmann, Maximilian, 3,932,620.
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Warner & Swasey Company, The: *See—*
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Wasley, William L.; and Pittman, Aller G., to United States of America, Agriculture. Process for setting textiles. 3,932,124, Cl. 8-127.500.

Wasley, William L.; and Pittman, Allen G., to United States of America, Agriculture. Preparation of stretchable wool textiles. 3,932,125, Cl. 8-128.00R.

Wass, Heinrich. Icebreaker vessel. 3,931,780, Cl. 114-41.000.

Wasserlein, Henry George, Jr.: *See—*
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Watanabe, Masatoshi; Takahashi, Noriyoshi; and Nagata, Ichiro, to Hitachi, Ltd. Cooling device for an electric rotary machine. 3,932,778, Cl. 310-61.000.

Watanabe, Tsutomu; Yamaoka, Sigenori; and Tanaka, Kochi, to Sumitomo Bakelite Company, Limited. Flexible adhesive composition and method for utilizing same and article formed therefrom. 3,932,689, Cl. 428-418.000.

Waters, David Martin: *See—*
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Watts, Harry L.: *See—*
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Watts, Willie H.; Lowey, Francis J., deceased; and by Old Phoenix National Bank, executor, to Friction Products Inc. High-energy brake and brake components. 3,932,568, Cl. 264-29.000.

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Way, Blaine A.; and Scholtz, William R., to Salient Electronics, Inc. Alarm system sensing device. 3,932,857, Cl. 340-280.000.

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Weber, Helmut; Aumuller, Walter; Muth, Karl; and Weyer, Rudi, to Hoechst Aktiengesellschaft. Benzenesulfonyl ureas. 3,932,503, Cl. 260-553.0DA.

Weber, Helmut; Aumuller, Walter; Muth, Karl; and Weyer, Rudi, to Hoechst Aktiengesellschaft. Composition and method for lower blood sugar containing N-[4-(β-2-methoxy-5-chloro-benzamido>-ethyl)-benzenesulfonyl]-N'-cyclopentyl-urea. 3,932,658, Cl. 424-321.000.

Weber, Helmut: *See—*
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Weber, Joseph Thomas, Jr.: *See—*
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Weber, Robert E.: *See—*
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Webster, John R., to Lindsay Olive Growers. Fruit stuffed with brine resistant hard gel and method of forming the same. 3,932,673, Cl. 426-49.000.

Weddle, Phillip M.: *See—*
Weedle, Rosemary B., 3,931,819.

Weedle, Rosemary B., to Weddle, Phillip M.; and Jackson, Auzville, Jr., part interest to each. Drainage bag for human body. 3,931,819, Cl. 128-283.000.

Weinstein, Harold, to Sensor Technology, Inc. Detector for tubular transparent article. 3,932,763, Cl. 250-576.000.

Weinstein, Stephen B. Motion picture sound synchronization. 3,932,032, Cl. 352-11.000.

Weir, Francis X., to Raymond Lee Organization, Inc., The, a part interest. Disposable bathtub liner. 3,931,651, Cl. 4-173.000.

Weiss, Manfred, to RCA Corporation. Optical reflector for lasers. 3,932,029, Cl. 350-310.000.

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Schaub, Robert Eugene; Floyd, Middleton Brawner, Jr.; and Weiss, Martin Joseph, 3,932,463.
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Weissner, Ruediger: *See—*
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Welch, Stanley B., to General Electric Company. Self-contained, condition responsive circuit. 3,932,849, Cl. 340-228.00R.

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Western Electric Company, Inc.: *See—*
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DeCaro, Aristide R.; Murphy, Eugene F.; and Maynard, Billy A., 3,932,780.
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Wetzel, William H.; Nelson, Harold G.; and Shelton, Frederic J., to Reichhold Chemicals, Inc. Alkylation of phenols. 3,932,537, Cl. 260-624.00C.

Wetzel, Wolfgang; and Muller, Manfred, to Imperial Chemical Ind. (Europa) Fibres. Apparatus for the detection of breaks in moving threadlines. 3,932,854, Cl. 340-259.000.

Weyer, Rudi: *See—*
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Weber, Helmut; Aumuller, Walter; Muth, Karl; and Weyer, Rudi, 3,932,658.

Whistler, Roy L., to Purdue Research Foundation. Method and compound for parasite control. 3,932,625, Cl. 424-180.000.

White, David John. Golf tube collar. 3,931,842, Cl. 150-1.50R.

White, George Raymond, to Smith Kline & French Laboratories, Inc. Sulphoxides. 3,932,443, Cl. 260-309.000.

White-Westinghouse Corporation: *See—*
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Widmayer, Don Frederick, to Controlled Environment Systems Inc. Plant growth method and apparatus. 3,931,695, Cl. 47-58.000.

Wiemers, Minny: *See—*
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Wigger, Ralph O.: *See—*
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Willard, Edwin J.; and Carpenter, Leslie E., Jr., to Longview Fibre Company. Horizontal conveyor load moving apparatus. 3,931,883, Cl. 198-218.000.

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Williamson, David Howard: *See—*
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Wilson, Edward L.; Mitchell, Willard N.; and von Rosenberg, Hermann E., to Exxon Research and Engineering Company. Process for the fluid bed gasification of agglomerating coals. 3,932,146, Cl. 48-210.000.

Wilson, Ian C. Method of treating schizophrenia. 3,932,623, Cl. 424-177.000.

Wilson, Ronald, to National Research Development Corporation. Gas sensitive devices. 3,932,807, Cl. 324-71.0SN.

Winn, Martin, to Abbott Laboratories. Alkylphenyl benzopyranopyridines. 3,932,432, Cl. 260-297.00T.

Woitun, Eberhard; and Reuter, Wolfgang, to Boehringer Ingelheim GmbH. Biocidal compositions containing a 2- (5'-nitro-2'-furyl)-thieno(2,3-d) pyrimidine and methods of use. 3,932,642, Cl. 424-251.000.

Wolf, Gerhard Dieter: *See—*
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Wolgemuth, Larry G.; and Wilbur, Benjamin C., to Atlantic Richfield Company. Stabilization of thermoplastic polyurethanes derived from cyclic nitrile compounds. 3,932,354, Cl. 260-45.950.

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Woodward, Oakley McDonald, to RCA Corporation. Broadband turnstile antenna. 3,932,874, Cl. 343-795.000.

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Wulleman, Vianney Jean-Marie Corneille, to Centre National d'Etudes Spatiales. PSK telemetering synchronization and demodulation apparatus including an ambiguity eliminating device. 3,932,705, Cl. 178-68.000.

Wunsch, Steffen, to Robert Bosch G.m.b.H. Hammer-drill. 3,931,744, Cl. 74-22.000.

Wycoff, Keith H. Signal selective circuit. 3,932,824, Cl. 333-70.00R.

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Yaguchi, Masachika; and Furuta, Shigetaro, to Dai Nippon Toryo Kabushiki Kaisha. Electro-optical devices. 3,932,024, Cl. 350-160.0LC.

Yahraus, Theodor G., to General Electric Company. Joint structure. 3,932,050, Cl. 403-11.000.

Yamada, Osamu: *See—*
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Yamaguchi, Tadashi; Ono, Takayuki; Hoshi, Hiroshi; Hirakawa, Michio; and Watanabe, Isao, to Lion Fat & Oil Co., Ltd. Method of manufacturing reinforced resin moldings. 3,932,350, Cl. 260-42.140.

Yamaha International Corporation: *See—*
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Yamamoto, Hisao; Inaba, Shigeho; Akatsu, Mitsuhiro; Baile, Clifton A.; and Parish, Roger G., to Sumitomo Chemical Company, Limited; and SmithKline Corporation. Methods and compositions for improving the feed intake of meat producing animals. 3,932,637, Cl. 424-244.000.

Yamamoto, Shigehiko: *See—*
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Yamazaki, Noboru; and Higashi, Fukuji, to Sumitomo Chemical Company, Limited. Production of polyamides in the presence of a phosphorus acid ester and an organic base. 3,932,364, Cl. 260-78.00R.

Yanagihara, Hideki: *See—*
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Yasuda, Shinichi: *See—*
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Yazu, Shuji: *See—*
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Yeager, Marvin Leo; and Henschen, Homer Ernst, to AMP Incorporated. Shunt assembly. 3,932,013, Cl. 339-19.000.

Yocum, Charles H., to Rock Valley Water Conditioning, Inc. Multitank ion exchange water treatment system. 3,932,279, Cl. 210-96.000.

Yokoo, Teruo, to Nippon Electric Company, Ltd. Common control switching system. 3,932,844, Cl. 340-172.500.

Yokotsuka, Tamotsu; Iwaasa, Takashi; Okami, Tadao; Noda, Minoru; and Fujii, Mitsuharu, to Kikkoman Shoyu Co., Ltd. Process for producing protein hydrolyzate. 3,932,671, Cl. 426-7.000.

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Baldwin, James French. High temperature alloys. Re. 28,681, Cl. 75-134.00F.

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Hoey, Charles E., to Rohm & Haas Company. Decorative laminate. Re. 28,682, Cl. 428-196.000.

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Kupsky, George A., to Burroughs Corporation. Gaseous discharge display panel with auxiliary excitation cells. Re. 28,683, Cl. 340-378.00R.

Marsh, Paul G.: *See—*
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Robinson, Edgar Clarence, to International Industries Ltd. Burners. Re. 28,679, Cl. 431-9.000.

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Apodaca, Herman S. Bicycle. 238,419, 1–13–76, Cl. D12—111.

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Bittner, John R., K. C. McCartney, and G. F. Fossella, to General Electric Co. Cabinet for an input-output device for a data handling system. 238,451, 1–13–76, Cl. D64—11.

Blanchard, Julius B., to E. Gluck Corp. Wristwatch. 238,413, 1–13–76, Cl. D10—38.

Bobrick, Mitchell. Cantilever mountable hospital bed. 238,406, 1–13–76, Cl. D6—79.

Bontempi, Paolo. Toy electric organ or similar article. 238,438, 1–13–76, Cl. D34—15.

Chang, Brian, and J. Dolan. Semi-submersible barge. 238,418, 1–13–76, Cl. D12—66.

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Hauser, Jon W. II, to Elgin Metal Casket Co. Casket lock handle. 238,432, 1–13–76, Cl. D31—11.

Hermann, Thomas L. Banking machine terminal or similar article. 238,429, 1–13–76, Cl. D26—5.

Hirasa, Hiroshi, K. Hoshino, and B. Mishiro, to Matsushita Electrical Industrial Co., Ltd. Radio receiver. 238,447, 1–13–76, Cl. D56—4.

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Julian, Robert A. Lawn edger attachment for self-propelled lawnmowers. 238,441, 1–13–76, Cl. D40—1.

Kata, Joseph, and M. J. Wolff, to Sperry Remington Sperry Rand Corp. Hair groomer attachment. 238,453, 1–13–76, Cl. D86—10.

Kienlen, Loren C., and J. H. Poppler, to Doormaid, Inc. Stand for hot cooking utensils. 238,409, 1–13–76, Cl. D7—130.

Kitson, Gerald L. Poultry feed chain loader. 238,445, 1–13–76, Cl. D55—1.

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McKelvey, Thomas H. Goifers multi-purpose tool. 238,436, 1–13–76, Cl. D34—5.

Midgley, Thomas III, and R. E. Forrester, to Forrgley, Inc. Leveling instrument. 238,415, 1–13–76, Cl. D10—65.

Ostrander, Robert K., to The Quaker Oats Co. Water toy. 238,439, 1–13–76, Cl. D34—15.

Owens, Marion D. Toy or miniature coffee table with v-shaped end supports. 238,407, 1–13–76, Cl. D6—175.

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Verdier, Henri, to Compagnie Generale des Etablissements-Michelin, raison sociale Michelin & Cie. Tire. 238,420, 1–13–76, Cl. D12—143.
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204 3,932,192
211 3,932,193
306 3,932,194

CLASS 108
77 3,931,771
161 3,931,772

CLASS 110
165R 3,931,773

CLASS 111
3 3,931,774

CLASS 112
113 3,931,775

CLASS 113
120XY 3,931,776

CLASS 114
16A 3,931,777
26 3,931,778
39 3,931,779
41 3,931,780
126 3,931,781
206R 3,931,782

CLASS 115
34R 3,931,783
41R 3,931,784

CLASS 116
106 3,931,785

CLASS 118
6 3,931,786
8 3,931,787
3,931,788
49 3,931,789
73 3,931,790
236 3,931,791
637 3,931,792
3,931,793

CLASS 119
14.08 3,931,794
14.38 3,931,795
151 3,931,796

CLASS 123
8.05 3,931,807
32EA 3,931,808
43R 3,931,809
44E 3,931,810
52M 3,931,811
73S 3,931,812
119A 3,931,813
119F 3,931,797
119R 3,931,814
120 3,931,798
122AB 3,931,799
133 3,931,800
134 3,931,801
139AW 3,931,802
3,931,803
148E 3,931,804

CLASS 126
41R 3,931,805
400 3,931,806

CLASS 128
2F 3,931,815
78 3,931,816
80A 3,931,817
214C 3,931,818
283 3,931,819
304 3,931,820
335 3,931,821
351 3,931,822

CLASS 130
30R 3,931,823

CLASS 131
2 3,931,824
140A 3,931,825

CLASS 132
9 3,931,826
56 3,931,827

CLASS 134
167R 3,931,828

CLASS 136
6FS 3,932,195
107 3,932,196
120FC 3,932,197

CLASS 137
329.1 3,931,829
505.45 3,931,830
525 3,931,831
624.11 3,931,832
829 3,931,833

CLASS 138
30 3,931,834
42 3,931,835
141 3,931,836

CLASS 139
122N 3,931,837

CLASS 140
123.6 3,931,838
124 3,931,839

CLASS 141
1 3,931,840

CLASS 144
309R 3,931,841

CLASS 148
6.2 3,932,198
9C 3,932,199
26 3,932,200
27 3,932,201
31.5 3,932,202
3,932,203
103 3,932,204
108 3,932,205
112 3,932,234
113 3,932,235
3,932,236
3,932,237
131 3,932,238
186 3,932,239

CLASS 149
19.2 3,932,240
19.3 3,932,241
19.9 3,932,242

CLASS 150
1.5R 3,931,842

CLASS 152
330L 3,931,843
360 3,931,844

CLASS 156
20 3,932,243
71 3,932,244
79 3,932,245
89 3,932,246
148 3,932,247
210 3,932,248
213 3,932,249
3,932,250
245 3,932,251
3,932,252
249 3,932,253
361 3,932,254
401 3,932,255
417 3,932,256
497 3,932,257
498 3,932,258
510 3,932,259
583 3,932,260

CLASS 157
1.22 3,931,845

CLASS 160
178 3,931,846

CLASS 162
5 3,932,206
19 3,932,207
136 3,932,208
157C 3,932,209
3,932,210

CLASS 164
4 3,931,847
83 3,931,848
274 3,931,849
281 3,931,850

CLASS 165
2 3,931,851
9 3,931,852
87 3,931,853
166 3,931,854

CLASS 166
128 3,931,855
245 3,931,856

CLASS 171
14 3,931,857

CLASS 172
63 3,931,858
247 3,931,859

CLASS 174
48 3,932,696
79 3,932,697

CLASS 176
19R 3,932,211
36R 3,932,215
37 3,932,212
60 3,932,213
65 3,932,214
78 3,932,216
83 3,932,217

CLASS 177
257 3,931,860

CLASS 178
5.6 3,932,698
6.5 3,932,699
6.6R 3,932,700
3,932,701
6.8 3,932,702
3,932,703
66A 3,932,704
68 3,932,705

CLASS 179
1GQ 3,932,706
16AA 3,932,707
84VF 3,932,708
90K 3,932,709
100.4R 3,932,710
142 3,932,711
170R 3,932,712
174 3,932,713

CLASS 180
5R 3,931,861
3,931,862
71 3,931,863
82C 3,931,866
116 3,931,864

CLASS 181
.5 3,931,865
155 3,931,867

CLASS 182
63 3,931,868

CLASS 188
41 3,931,869
296 3,931,870
344 3,931,871

CLASS 191
12R 3,932,714

CLASS 192
43 3,931,872
53C 3,931,873
54 3,931,874
98 3,931,875
106.2 3,931,876

CLASS 193
15 3,931,877
37 3,931,878

CLASS 195
49 3,932,218
81 3,932,219
103.5R 3,932,220
3,932,221
127 3,932,222
139 3,932,223

CLASS 198
21 3,931,879
29 3,931,880
165 3,931,881
3,931,882

218 3,931,883
287 3,931,884

CLASS 200

48SB 3,932,715
50A 3,932,716
61.08 3,932,717
61.93 3,932,718
148R 3,932,720
148 3,932,719
302 3,932,721
340 3,932,722

CLASS 203

7 3,932,224

CLASS 204

1.5 3,932,225
16 3,932,226
3,932,227
26 3,932,228
105R 3,932,230
180G 3,932,229
181 3,932,231
192 3,932,232
195M 3,932,233
288 3,932,261
299 3,932,262
3,932,263
3,932,264
3,932,265

CLASS 206

44R 3,931,885
390 3,931,886
419 3,931,887
434 3,931,888
493 3,931,889
508 3,931,890
538 3,931,891

CLASS 208

10 3,932,266
87 3,932,267
120 3,932,268
157 3,932,269
216 3,932,270

CLASS 209

9 3,932,271
73 3,932,272
74M 3,931,892
309 3,932,442

CLASS 210

17 3,932,273
44 3,932,274
49 3,932,275
54 3,932,276
77 3,932,277
80 3,932,278
96 3,932,279
119 3,932,280
163 3,932,281
195 3,932,282
321 3,932,283
523 3,932,284

CLASS 211

64 3,931,893
177 3,931,894

CLASS 214

1A 3,931,895
1P 3,931,896
6G 3,931,897
32 3,931,898
38CC 3,931,899
302 3,931,901
390 3,931,902
450 3,931,903

CLASS 215

254 3,931,904

CLASS 219

10.55B 3,932,723
98 3,932,724
110 3,932,725
121LM 3,932,726
131R 3,932,728
301 3,932,727
486 3,932,729

CLASS 220

2.1 3,931,906
22 3,931,907
71 3,931,908
268 3,931,909
278 3,931,905
329 3,931,910

CLASS 222

56 3,931,911
94 3,931,912
146C 3,931,913
193 3,931,914
327 3,931,915
465 3,931,916

CLASS 224

5R 3,931,917
10 3,931,918
42.1F 3,931,919

CLASS 226

91 3,931,920

CLASS 228

1 3,931,921
6 3,931,922

CLASS 229

23R 3,931,923
28R 3,931,924
43 3,931,925
45R 3,931,926

CLASS 233

19R 3,931,927
21 3,931,928

CLASS 234

110 3,931,929

CLASS 235

61.11D 3,932,731
61.9R 3,932,730
92CT 3,932,732
151 3,932,733
151.1 3,932,736
152 3,932,737
153AP 3,932,738
155 3,932,739
175 3,932,734
186 3,932,740
197 3,932,741

CLASS 236

1C Re.28,676

CLASS 239

7 3,931,930
287 3,931,931
431 3,931,932
591 3,931,933
657 3,931,934

CLASS 240

41.6 3,932,837

CLASS 241

24 3,931,935
46.08 Re.28,677
46.15 3,931,936
74 3,931,937
296 3,931,900

CLASS 242

45 3,931,938
47.01 3,931,939
56R 3,931,940
110 3,931,941

CLASS 244

12R 3,931,942
86 3,931,943
110B 3,931,944
145 3,931,945

CLASS 248

68R 3,931,946
108 3,931,950
180 3,931,947
318 3,931,948
418 3,931,949

CLASS 249

158 3,931,951
177 3,931,952

CLASS 250

199 3,932,742
202 3,932,743
203 3,932,744
216 3,932,745
221 3,932,746
256 3,932,747
303 3,932,748
306 3,932,749
315A 3,932,750
315 3,932,751
328 3,932,752
332 3,932,753
343 3,932,754
349 3,932,755
361 3,932,756
365 3,932,757
390 3,932,758
416 3,932,759
492 3,932,760
552 3,932,761
574 3,932,762
576 3,932,763

CLASS 251

62 3,931,953
109 3,931,954
305 3,931,955

CLASS 252

1 3,932,285
12.4 3,932,286
32.5 3,932,287
33 3,932,288
42.7 3,932,289
49.8 3,932,290
62.3R 3,932,292
62.3V 3,932,291
62.55 3,932,293
78 3,932,294
102 3,932,295
148 3,932,296
171 3,932,297
299 3,932,298
300 3,932,299
301.1W 3,932,300
301.2W 3,932,301
359E 3,932,302
389A 3,932,303
428 3,932,304
429R 3,932,305
430 3,932,306
3,932,307
431R 3,932,308
439 3,932,309
455R 3,932,310
514 3,932,311
518 3,932,312
520 3,932,313
521 3,932,314
3,932,315
532 3,932,316
541 3,932,317

CLASS 254

8B 3,931,956
127 3,931,957
150R 3,931,958

CLASS 259

151 3,931,959

CLASS 260

2.5F 3,932,318
7.5 3,932,319
17R 3,932,320
17.4GC 3,932,322
17.4R 3,932,321
23H 3,932,323
3,932,324
26 3,932,326
27BB 3,932,327
3,932,328
3,932,330
27R 3,932,329
28 3,932,331
28.5A 3,932,332
29.1SB 3,932,337
29.3 3,932,333
3,932,334
29.6WA 3,932,335
29.6R 3,932,336
32.8SB 3,932,339
32.8A 3,932,338
33.4R 3,932,340
33.6AQ 3,932,341
37EP 3,932,343
37N 3,932,342
38 3,932,344
40P 3,932,345
42.14 3,932,347
3,932,348
3,932,349
3,932,350
42.21 3,932,346
45.7P 3,932,351
45.75G 3,932,353
45.8N 3,932,352
45.95 3,932,354
63HA 3,932,355
75EP 3,932,356
75NH 3,932,357
75N 3,932,358
77.5AM 3,932,360
77.5B 3,932,361
77.5R 3,932,359
78SC 3,932,363
78L 3,932,366
78R 3,932,364
3,932,365
78S 3,932,362
78.4D 3,932,367
3,932,368
79.3A 3,932,369
83.3 3,932,370
85.3R 3,932,371
92.8W 3,932,372
93.1 3,932,373
112.5R 3,932,374
3,932,375
158 3,932,377
174 3,932,378
186 3,932,376
191 3,932,379
197 3,932,380
3,932,381
3,932,382
3,932,383
210AB 3,932,384
239D 3,932,385
239.1 3,932,386
3,932,387
239.55R 3,932,388
240R 3,932,389
243C 3,932,391
3,932,392
3,932,393
3,932,396
3,932,397
3,932,398
3,932,465
243R 3,932,390
3,932,394
3,932,395
3,932,399
247.1M 3,932,400
248CS 3,932,402
248NS 3,932,401
248R 3,932,403
250BC 3,932,404
250A 3,932,405
250Q 3,932,406
251Q 3,932,325
256.4F 3,932,407
256.4N 3,932,408
256.4Q 3,932,409
256.5R 3,932,410
268BC 3,932,411
268BQ 3,932,412
270H 3,932,413
279R 3,932,414
286R 3,932,415
287F 3,932,416
287R 3,932,417
288CE 3,932,418
289QP 3,932,419
289A 3,932,420
290P 3,932,421
293.54 3,932,422
293.57 3,932,423
293.61 3,932,424
293.62 3,932,425
293.67 3,932,426
294.8H 3,932,427
295F 3,932,428
295.5B 3,932,429
296R 3,932,431
296T 3,932,430
297T 3,932,432
302E 3,932,433
305 3,932,434
3,932,435
306.7R 3,932,436
306.8D 3,932,437
3,932,438
307A 3,932,439
308D 3,932,440
3,932,441
309 3,932,443
3,932,444
3,932,445
309.2 3,932,446
3,932,447
3,932,448
309.5 3,932,176
3,932,449
309.6 3,932,450
3,932,451
309.7 3,932,452
310R 3,932,453
314.5 3,932,454
315 3,932,455
3,932,456
326C 3,932,457
326.62 3,932,458
332.2A 3,932,459
340.5 3,932,461
340.7 3,932,460
3,932,462
3,932,463
340.9 3,932,464
345.2 3,932,466
345.7 3,932,467
346.1R 3,932,468
346.8R 3,932,469
347.4 3,932,470
349 3,932,471
3,932,472
369 3,932,473
3,932,474
396R 3,932,475
404 3,932,476
429CY 3,932,477
429.7 3,932,478
448A 3,932,479
453R 3,932,480
457 3,932,481
465.6 3,932,483
468D 3,932,486
3,932,487
468L 3,932,485
468R 3,932,484
468.5 3,932,482
473.5 3,932,488
482C 3,932,489
501.11 3,932,490
501.12 3,932,491
501.14 3,932,492
501.18 3,932,493
502.6 3,932,494
514D 3,932,496
514J 3,932,497
515A 3,932,498
3,932,499
526N 3,932,500
534C 3,932,501
553DA 3,932,503
553B 3,932,502
555A 3,932,504
559H 3,932,505
561N 3,932,506
566AC 3,932,508
3,932,509
566D 3,932,507
567.6M 3,932,495
570.9 3,932,512
586AB 3,932,513
586C 3,932,511
586F 3,932,515
3,932,516
586P 3,932,514
586R 3,932,510
3,932,517
3,932,518
590 3,932,519
594 3,932,520
597B 3,932,521
603HF 3,932,522
604HF 3,932,523
606.5P 3,932,524
607A 3,932,526
607D 3,932,525
609F 3,932,527
610A 3,932,528
611R 3,932,529
613R 3,932,530
615B 3,932,531
615R 3,932,532
617R 3,932,533
618H 3,932,534
619A 3,932,535
620 3,932,536
624C 3,932,537
625 3,932,538
631.5 3,932,539
633 3,932,540
3,932,541
650R 3,932,542
654H 3,932,543
658R 3,932,544
665R 3,932,545
666C 3,932,546
667 3,932,547
668D 3,932,548
669R 3,932,549
677R 3,932,550
680E 3,932,551
682 3,932,552
683.15B 3,932,553
683.68 3,932,554
825 3,932,555
836 3,932,556
837R 3,932,557
841 3,932,558
847 3,932,559
851 3,932,560
858 3,932,561
873 3,932,562
897B 3,932,563
899 3,932,564
928 3,932,565
930 3,932,566

CLASS 261

30 3,932,567

CLASS 264

29 3,932,568
51 3,932,569
69 3,932,570
78 3,932,571
99 3,932,572
118 3,932,573
147 3,932,574
154 3,932,575
178F 3,932,576
182 3,932,577
331 3,932,578

CLASS 266

34A 3,931,960

CLASS 267

64R 3,931,961

CLASS 269

55 3,931,962

CLASS 270

61R 3,931,963

CLASS 271

93 3,931,964

CLASS 273

29BF 3,931,965
74 3,931,967
75 3,931,968
79 3,931,969
85D 3,931,970
106R 3,931,971
110 3,931,972
123R 3,931,973
126R 3,931,974
164 3,931,975

CLASS 274

54C 3,931,966

CLASS 277

80 3,931,976
81P 3,931,977
93 3,931,978

CLASS 279

107 3,931,979

CLASS 280

11.35D 3,931,982
11.35R 3,931,980
11.35T 3,931,981
12.14 3,931,983
33.99C 3,931,984
42 3,931,985
43.2 3,931,986
80B 3,931,987
150B 3,931,988
283 3,931,989
3,931,990
295 3,931,991

CLASS 285

30 3,931,992
200 3,931,993

CLASS 296

24R 3,931,994

CLASS 297

341 3,931,995
366 3,931,996

CLASS 299

10 3,931,997

CLASS 301

63R 3,931,998

CLASS 302

14 3,931,999

CLASS 303

21BE 3,932,000
22R 3,932,001
3,932,002
68 3,932,003

CLASS 307

85 3,932,764
149 3,932,765
229 3,932,766
235R 3,932,767
237 3,932,768
252UA 3,932,770
252G 3,932,769
264 3,932,772
265 3,932,771
270 3,932,773
308 3,932,774
311 3,932,775

CLASS 308

138 3,932,005
187 3,932,006
238 3,932,004
3,932,007
3,932,008

CLASS 310

4 3,932,776
8 3,932,777
61 3,932,778
215 3,932,779

CLASS 312

312 3,932,009
320 3,932,010

CLASS 313

113 3,932,780
198 3,932,781
220 3,932,782
492 3,932,783

CLASS 314

60 3,932,784
130 3,932,785

CLASS 315

3 3,932,786
39.61 3,932,787
82 3,932,788

CLASS 316

17 3,932,011

CLASS 317

13R 3,932,789
18D 3,932,790
33SC 3,932,791

CLASS 318

119 3,932,792
138 3,932,793
318 3,932,794
669 3,932,795
685 3,932,796

CLASS 320

48 3,932,797

CLASS 321

27R 3,932,799
43 3,932,800
45C 3,932,798
3,932,801

CLASS 323

6 3,932,802
19 3,932,803
48 3,932,804
102 3,932,808

CLASS 324

.5A 3,932,805
51 3,932,806
71SN 3,932,807
96 3,932,809
126 3,932,810
158MG 3,932,811
161 3,932,812
164 3,932,813

CLASS 325

332 3,932,814
445 3,932,815

CLASS 328

61 3,932,816
128 3,932,817
167 3,932,818
3,932,819

CLASS 330

43 3,932,820

CLASS 331

25 3,932,821

CLASS 333

9 3,932,822
21R 3,932,823
70R 3,932,824

CLASS 335

8 3,932,825
240 3,932,826

CLASS 336

60 3,932,827
96 3,932,828

CLASS 337

49 3,932,829
64 3,932,830

CLASS 338

143 3,932,831
166 3,932,832

CLASS 339

17CF 3,932,012
19 3,932,013
22B 3,932,014
58 3,932,015
65 3,932,016
97P 3,932,017
99R 3,932,018
176M 3,932,019
177R 3,932,020
266R 3,932,021

CLASS 340

5S 3,932,833
7R 3,932,834
3,932,835
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49 : Re.28,680
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DESIGN PATENTS

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Rogers C. B. Morton, *Secretary*

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